



Government  
Energy  
Market  
Segment  
Evaluation  
Tool

## **Final Report**

*GEMSET Regional Segmentation Analysis:*

# **Characterization of the New York State Region**

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## Characterizing the NYISO Region

### Key Services

- Characterize current NYISO day-ahead electric sale prices, and potential return to generating unit owners from operation within NYISO
- Estimate NYISO demand growth, the existing units in NYISO, and the generating units in the queue for construction to meet demand growth
- Evaluate the fuel price history and prospects for the NYISO region
- Provide the historical base of information needed to evaluate the economic merits of new generation projects for consideration in NYISO

### Study Region

New York State

### Client

U.S. Department of Energy  
National Energy Technology Laboratory

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## Project Description

### Electric Power Market Condition Evaluation in a Competitive Electric Market Region

The NYISO serves the electric market in the state of New York, and includes one of the most densely populated urban areas in the United States, the New York City metropolitan area. New York State encompasses 7% of all U.S. households. Parsons evaluated the competitive market conditions that exist in the NYISO region. Some features of this study include the following:

- Day-ahead prices and demand were characterized hour-by-hour.
- A data base is developed that characterizes NYISO hour-by-hour price and load demand that allows ease of evaluation of the potential return to units having different production costs.
- Fuel prices within the region were assessed and projected for future evaluations.
- The units operating in the region are identified.
- The future expectation of NYISO for demand growth, and the queue of units that might meet that demand growth identified.



### Key project team members:

- Richard E. Weinstein, P.E.
- Albert A. Herman, Jr.
- Francis J. Carey

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## Abbreviations and Acronyms

<b><u>Term</u></b>	<b><u>Meaning</u></b>
<b>AGC</b> .....	automatic generation control
<b>AVR</b> .....	automatic voltage regulator
<b>BME</b> .....	balancing market evaluation
<b>CARL DATA</b> .....	control area resource and load data submitted by Control Area Resources to the ISO
<b>COE (meaning 1)</b> .....	in economic sections: the cost of electricity, the levelized busbar cost of electric production including amortized capital, operating, and maintenance costs
<b>combustion turbine, CT</b> .....	a synonym for gas turbine, used interchangeably
<b>DAM</b> .....	day ahead market
<b>DOE</b> .....	United States Department of Energy
<b>DMNC</b> .....	dependable maximum net capability
<b>DNI</b> .....	desired net interchange
<b>EFORd</b> .....	demand equivalent forced outage rate
<b>eGADS</b> .....	electronic generator availability data system; an electronic data system allowing the posting of data regarding a generating unit's availability record
<b>EIA</b> .....	the Energy Information Administration of the DOE
<b>EPRI</b> .....	the Electric Power Research Institute
<b>EPA</b> .....	U.S. Environmental Protection Agency
<b>FERC</b> .....	Federal Energy Regulatory Commission
<b>FGD</b> .....	flue gas desulfurization, a sulfur emission control device
<b>GADS</b> .....	generator availability data system; see "eGADS"
<b>gas turbine, GT</b> .....	a synonym for combustion turbine, used interchangeably
<b>GEMSET</b> .....	government energy market segment evaluation tool
<b>GNP</b> .....	gross national product
<b>GT</b> .....	gas turbine (a synonym for combustion turbine)
<b>GTCC</b> .....	natural gas fueled gas turbine combined cycle
<b>HHV</b> .....	higher heating value of a fuel including the heat released if all of the water vapor in the combustion products were condensed
<b>HAM</b> .....	hour ahead market

<b>IPP</b>	an independent power producer, an unregulated electric generating company
<b>IRM</b>	installed reserve margin
<b>IRP</b>	integrated resource plan
<b>ISO</b>	independent system operator; a regulated body that dispatches all competitive electric generation on the high voltage transmission grid within its service region; they operate the grid, administer the power pools power transfers, select the lower cost generation bid into the pool according to the pool's operating rules, and maintains the integrity of the electric transmission grid
<b>LBMP</b>	locational-based marginal pricing
<b>LCC</b>	local control center
<b>LHV</b>	lower heating value of a fuel, the heat released if all of the water vapor in the combustion products remained as steam
<b>LOC</b>	lost opportunity cost
<b>MCR</b>	maximum continuous rating
<b>MVA</b>	megavolt amperes
<b>MVAR</b>	megavolt-ampere-reactive
<b>MWe</b>	electrical megawatts
<b>MWth</b>	thermal megawatts
<b>NETL</b>	the U.S. Department of Energy's National Energy Technology
<b>NOPR</b>	notice of proposed rulemaking
<b>NOx</b>	nitrogen oxides, types of air pollutant, mainly NO and NO <sub>2</sub>
	non-utility generator, a competitive, unregulated independent electric power producer
<b>NYCA</b>	New York Control Area
<b>NYISO</b>	the New York State independent system operator
<b>NYSRC</b>	New York State Reliability Council
<b>OATT</b>	open access transmission tariff
<b>OTAG</b>	Ozone Transport Assessment Group
<b>OTR</b>	Northeast Ozone Transport Region
<b>Parsons I&amp;T, PI&amp;T</b>	Parsons Infrastructure & Technology Group Inc., a global business unit of Parsons Corporation, an engineering/ construction company; part of the DOE team that prepared this report
<b>PCD</b>	particulate emission control device
<b>P.E.</b>	licensed professional engineer
<b>NYISO</b>	New York Independent System Operator.
<b>PSC</b>	local state Public Service Commission

**RACT** .....reasonably available control technology (pollution control)  
**RMCP** .....regulation market clearing price  
**RTO** .....regional transmission owner  
**SCD** .....security constrained dispatch  
**SCUC** .....security constrained utility commitment  
**SRE** .....supplemental resources evaluation  
**SO<sub>x</sub>** .....sulfur oxides, types of air pollutant, mainly SO<sub>2</sub>  
**TCC** .....Transmission Congestion Contracts  
**VAR** .....volt-ampere-reactive

## 1. Summary

The New York Independent System Operator (NYISO) is an outgrowth of the New York Power Pool (NYPP). The NYPP had been the operating arm of New York's eight largest utilities. NYISO facilitates fair and open competition in the wholesale power market and creates and electricity commodity market. It enables the State's utilities, and other market participants, to offer electricity at competitive prices while maintaining a reliable and safe electric transmission system. Established on December 1, 1999, NYISO, today handles the dispatch of over 37,000 megawatts of electric capacity, controlling the generation of over 700 operational electric generating units serving areas located throughout New York State. As of July, 2001 there were 101 generating projects seeking approval for interconnection with the state's transmission system which could ultimately add 38,551 MW of electric generation capacity.

This is a report about how electric power is sold in the region. It describes the competitive electric market in NYISO's territory. The report discusses the responsibilities of NYISO, which is New York State's independent system operator (ISO). As ISO, NYISO is responsible for the State's electric integrity, unit dispatch and reliability, and administering the pricing mechanisms for delivery of all power.

With the implementation of the "ISO Market Administration and Control Area Services Tariff" on December 1, 1999, NYISO began operating the New York State power system as a bid-based energy market. NYISO enables participants to buy and sell energy, schedule bilateral electric sale transactions, and reserve transmission service. It provides the accounting and billing services for these transactions.

This report describes how NYISO operates now, and includes NYISO's conjecture about how load might grow and be met by planned construction. The NYISO filed information on July 1, 2000 with the Energy Planning Board indicating that in-State capacity and known purchases from neighboring electric systems would be sufficient to meet the 18% capacity reserve through the end of the year 2000. However load growth during the year exceeded the high range estimates. The latest estimates indicated the State will be unable to meet the installed capacity reserve requirements as soon as the Summer of 2001, and steps have been taken to install over 400 MW's of diesels and small generators in the New York City area

The transmission system in the state includes more than 10,700 miles of high voltage (generally in excess of 115,000 volts) lines of which 600 miles are underground.

This report is one of a series describing the market conditions that exist, and that are forecast as part of the Department of Energy's (DOE) government energy market segment evaluation tool (GEMSET) project. Others in the series describe other regions.

GEMSET forecasts for the NYISO and other areas will be presented in future reports in the series. Future reports on the NYISO will be issued where the GEMSET evaluation team makes reasoned conjecture of what might occur in the electric power market in this region in the future under a range of possible future energy price and economic circumstances.

Based on an hour by hour evaluation of the fiscal year through June 2001, the average locational-based marginal pricing (LBMP) customer price of electricity in the New York region was \$ 42.91/MWh. However, this average price does not indicate all of the important circumstances for competitive electric sales. There were also five peak periods in the year, where the market price peaked above \$ 100/MWh. While these few brief excursions in peak price represent a relatively small fraction of the year, these same price peaks sometimes result in very significant financial aspects to energy suppliers and consumers.

This report includes the following discussions:

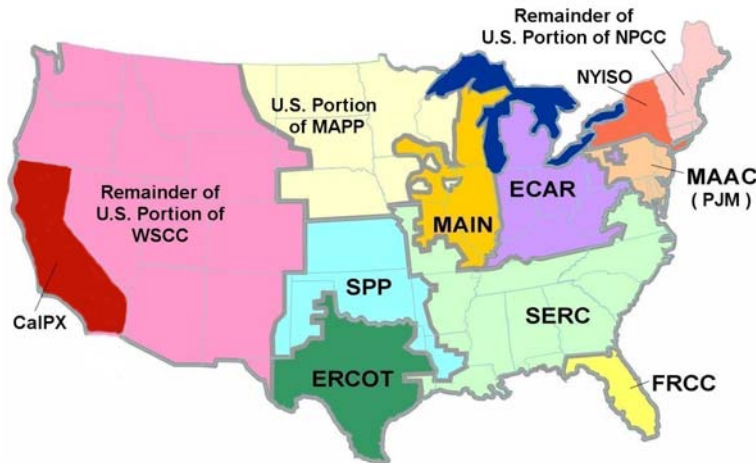
- Section 2 describes the NYISO region.
- Section 3 describes the energy prices throughout the most recent year, with histograms that characterize the price duration persistence in the region. This is the region's historical demand and price data, with information about energy prices, generation mix, and baseload and peaking demand.
- Section 4 discusses the specifics of the NYISO operations.
- Section 5 presents the identified generation in the NYISO by the GEMSET Team.
- Section 6 discussed adding generation capacity in the NYISO. The NYISO is required to provide open access to its transmission grid by FERC Order 888. While any qualified company can add generation, the process is not automatic. Rather, a sequence of approvals is needed before new generation can be added. NYISO's procedures for this approval are summarized in Section 6.
- Section 7 gives NYISO's forecasts and projections on demand growth, and on the capacity additions that are committed in the region. Other reports in this GEMSET series then analyze these NYISO forecasts, and assess them in the context of several future scenarios of factors influencing demand, generation mix, and price. Finally, this Section presents the historical and projected fuel prices in the NYISO region based on the GEMSET fuel characterization.

These data are dynamic, and what is reported here represents only a "snapshot" of information that existed a month prior to this report's issue date, September, 2001. Periodically, the NYISO region will be revisited, and this report revised as time moves on.

## 1.1 The Other GEMSET Regions

This is one of twelve regional assessments. The GEMSET regional characterizations generally follow the U.S. portions of the North American Reliability Council (NERC) regions, excepting the Alaska Systems Coordinating Council (ASCC) and Hawaii, which are not modeled. Two of the NERC regions are broken into parts, to separate out California and New York. The twelve GEMSET regions, and their associated NERC region are as shown in Exhibit 1-1.

**Exhibit 1-1 The GEMSET Regions**



The twelve GEMSET regions are:

<ul style="list-style-type: none"> <li>• <a href="#"><u>CALPX</u></a> - The California Power Exchange, a portion of the NERC's Western Systems Coordinating Council (WSCC).</li> <li>• <a href="#"><u>East Central</u></a> - East Central Area Reliability Coordination Agreement (ECAR).</li> <li>• <a href="#"><u>Florida</u></a> - Florida Reliability Coordinating Council (FRCC).</li> <li>• <a href="#"><u>Mid-America</u></a> - Mid-America Interconnected Network (MAIN).</li> <li>• <a href="#"><u>Mid-Continent</u></a> - the U.S. portion of the Mid-Continent Area Power Pool (MAPP).</li> <li>• <a href="#"><u>Northeast</u></a> - the U.S. portion of NERC's Northeast Power Coordinating Council (NPCC), excluding New York</li> </ul>	<ul style="list-style-type: none"> <li>• <a href="#"><u>NYISO</u></a> - The New York ISO, a portion of NERC's Northeast Power Coordinating Council (NPCC).</li> <li>• <a href="#"><u>PJM</u></a> - the Pennsylvania, New Jersey, Maryland Interconnect, which comprises the NERC's Mid Atlantic Area Council (MAAC).</li> <li>• <a href="#"><u>Southeast</u></a> - Southeast Electric Reliability Council (SERC).</li> <li>• <a href="#"><u>Southwest</u></a> - Southwest Power Pool (SPP).</li> <li>• <a href="#"><u>Texas</u></a> - Electric Reliability Council of Texas (ERCOT).</li> <li>• <a href="#"><u>Western</u></a> - the U.S. portion of the NERC's Western Systems Coordinating Council (WSCC), excluding California.</li> </ul>
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The reader should check with the DOE project manager, Patricia Rawls, to see if there is a more recent issue of this report, or to discuss any related information that might be available about the region or these other regions, or about the GEMSET project data.

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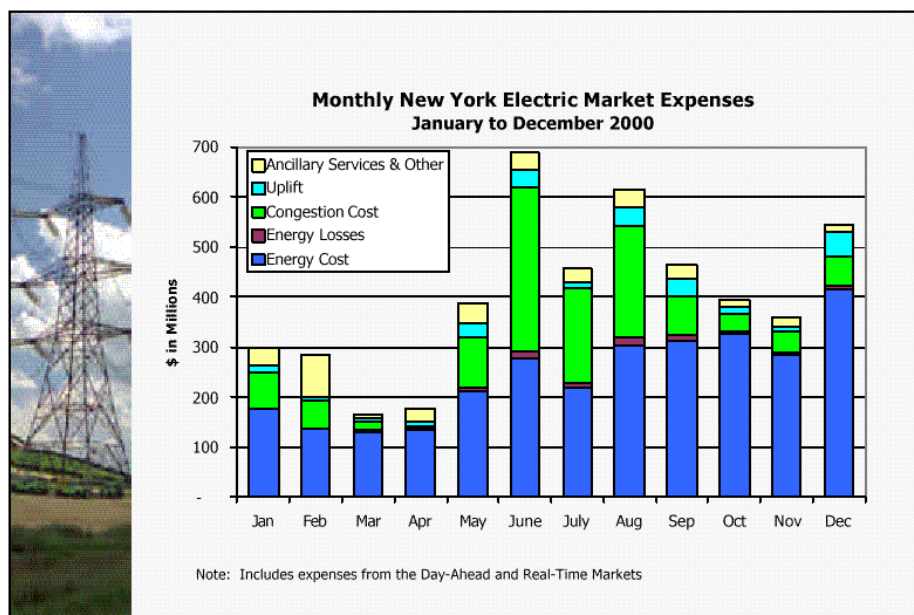
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## 2. NYISO Region

This section discusses the New York State regional segmentation used in the DOE GEMSET market analysis model. This region is served by a single ISO. This Power Exchange and its ISO (NYISO) is representative of a competitive market situation. It is significantly different from a regulated utility scenario where new generation options are approved by a commission or regulatory body. Under a competitive market, new generation is at more of a risk than a regulated market. New generation here is met by investors seeking profit due to sale price opportunities, and their perception of persistence of electric sales price in the region remaining sufficiently above their production costs to prove profitable.

In the NYISO region, most of the electric sales are pre-arranged by bilateral agreements, with the rest sold on the day-ahead or hour-ahead markets, which provide the market signals that guide and limit the value of the private bilateral sales. More than 95% of the Market Expenses are settled through the day-ahead market (DAM). The cost of the electricity is composed of expenses which include: energy cost, energy losses, congestion costs, uplift, and ancillary and other services. For the year 2000 these costs in the NYISO are summarized in Exhibit 2-1 providing the relative composition on a monthly basis.

**Exhibit 2-1**  
**Monthly NY Electric Market Expenses**





Within the NYISO region there are currently more than 700 operational electric generating units representing approximately 37,000 megawatts of summer capacity. Also there are certain electrical municipal utilities and corporations within the state that have additional generation capabilities that add to this. As of July, 2001 there were 101 generation projects seeking approval for interconnection that if approved could ultimately add another 38,000 megawatts.

The transmission system in the NYISO region includes more than 10,700 miles of high voltage (generally in excess of 115,000 volts) lines of which 600 miles are underground. At times the electrical requirement and generation over these lines interact to impede the flow of power resulting in a condition termed "congestion." This condition is a prominent feature of the New York power system. The congestion levels divide the state into 11 transmission zones as detailed in this report in Exhibit 2-2. There are eight transmission owners in the state. These include six investor-owned utilities and two power authorities which are listed in Section 2-2 below. To avoid overloading, the NYISO at times has to deviate from the least expensive (bid price) resources and re-dispatch to assure no transmission constraints are violated. Also the DAM prices cannot be completely locked in due to the actual cost of transmission congestion. This variable represents a risk to the bidders in the DAM. To remove this risk, TCC (Transmission Congestion Contracts) provide a market to pay a fixed price for transmission service ahead of time. Transmission Operators sell or auction transmission rights via TCC's to the Load Serving Entities (LSE). This removes the risk as long as the bidders perform consistent with their bids.

## **2.1 The Independent System Operator: NYISO Interconnection**

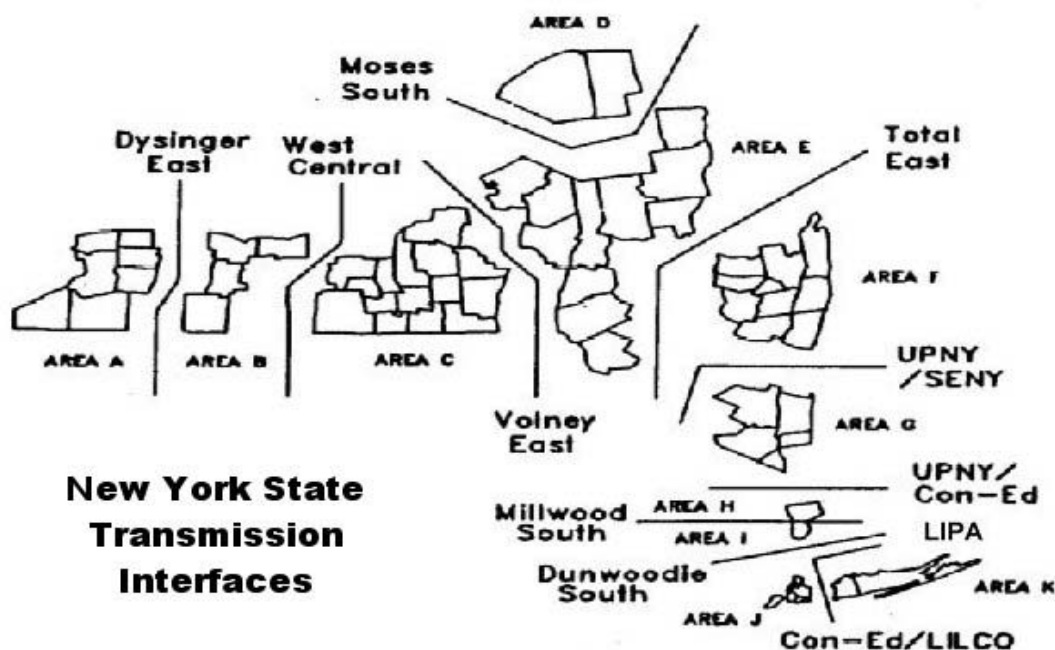
New York State's electric power is dispatched competitively. The independent system operator (ISO) for this region is NYISO. In addition to generation provided by the local distribution company, which had generation resources, and bilateral agreements for generation between a supplier and a generator.

## **2.2 Territory**

NYISO Interconnection is responsible for the day-to-day operation of the New York State electric system. The NYISO service area includes all of New York State, Exhibit 2-2.

**Exhibit 2-2  
The NYISO Region**

# NYCA Zones



The NYISO is governed by a ten-person Board of Directors (none of whom are affiliated with any market participant). The Board has the ultimate responsibility for the ISO and the effective implementation of the ISO's basic responsibilities. New York State Reliability Council and the Federal Energy Regulatory Commission (FERC) have jurisdiction within the NYISO control area. The NYISO conducts transmission operation and planning activities in coordination with the seven transmission owners and two transmission operators in New York State, which are:

- Transmission Owners
  - ◆ Central Hudson Gas & Electric
  - ◆ Consolidated Edison Company of New York, Inc.
  - ◆ Key Span Electric Services, LLC
  - ◆ New York State Electric & Gas Corporation
  - ◆ Niagara Mohawk Power Corporation

- ◆ Orange and Rockland Utilities, Inc.
- ◆ Rochester Gas and Electric Corporation
- Transmission Operators
  - ◆ Long Island Power Authority
  - ◆ New York Power Authority

## **2.3 NYISO's Responsibilities**

All ISOs have the principal responsibility for the safe and reliable operation of the transmission system. Even though electric generation is competitive within a region, an ISO is not competitive. An ISO operates as a monopoly, and correctly so. An ISO controls all of the generation within a region, operating for the public good, means an ISO is a regulated entity. As regulated entities, they are charged with ensuring the fair and reliable supply of energy from generating resources to wholesale customers.

Since the NYISO region is a competitive electric market, NYISO also is charged with administering the competitive wholesale energy market for the region, and, under the provisions of FERC Order 888, with facilitating open and fair access to transmission.

Each year the NYISO conducts a “Locational Installed Capacity Study” to determine locational installed capacity requirements for the New York Control Area. A locational ICAP (Installed Capacity Requirement) establishes the minimum amount of capacity that must be located within a given area. This minimum amount of capacity is developed considering the local generation and import capability. It is based on meeting the reliability criterion of the Northeast Power Council (NPCC) requiring NYCA loss of Load Expectation (LOLE) not to exceed one day in ten years. The study covering the 2000-2001 capability year established that only New York City and the Long Island localities in the NYCA require an ICAP which were 80% and 107% of their peak load respectively.

## 3. Historical Data

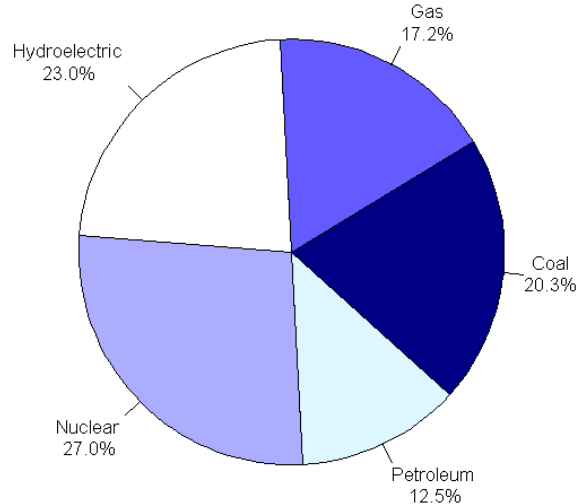
This section describes how NYISO now operates. These data represent the latest available data as of August 2001, when this section was last revised.

### 3.1 Generation Mix

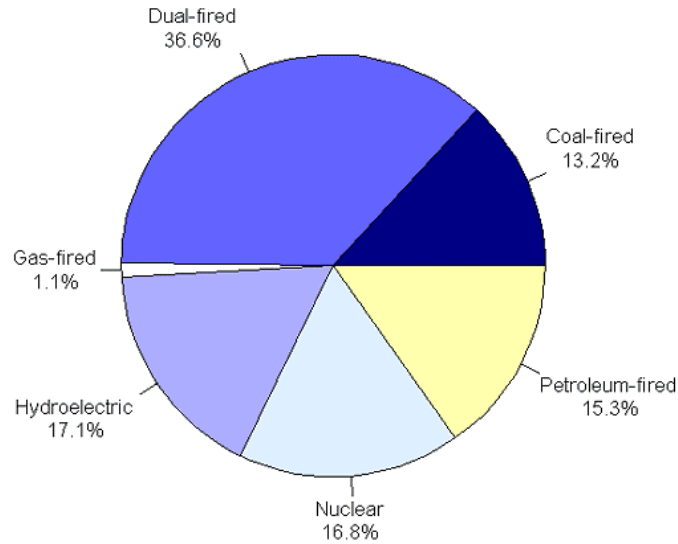
The installed capacity of NYISO decreased by 1 MW from 1999 to 2000. NYISO summer net installed capacity was 35,097.6 MW and the winter net installed capacity was 36,649.8 MW as of January 1, 2000

The installed capacity in the region by fuel and plant type is summarized in the Exhibits below. A complete listing of all identified operating units in NYISO is provided in Section 5, later in this report.

**Exhibit 3-1**  
**NYISO Installed Capacity by Fuel Type in 1998**

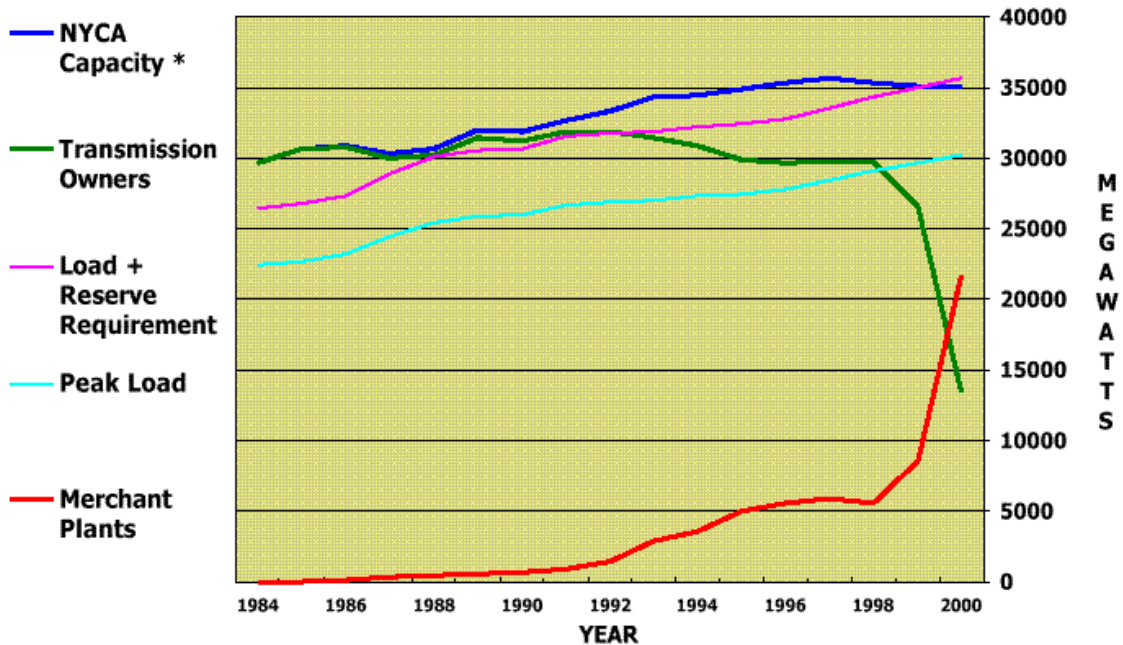


**Exhibit 3-2**  
**NYISO Installed Generating Capacity by Plant Type in 1998**



**Exhibit 3-3**  
**Generating Units by Ownership**

### NYCA Generating Capacity



\* Does not include Special Case Resources

## 3.2 Demand

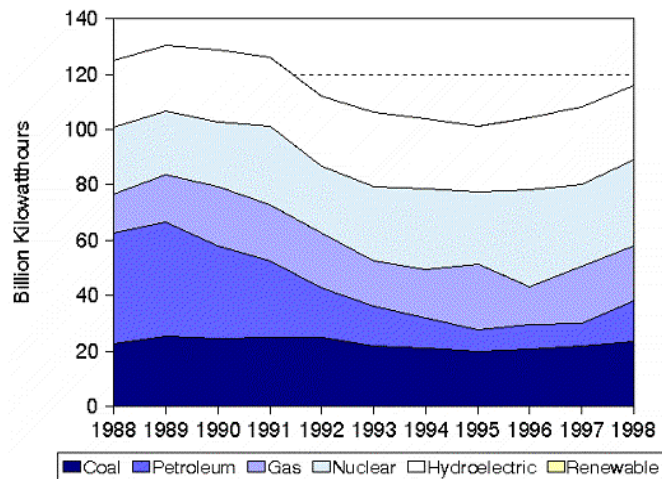
The NYISO 2000 peak load of 28,114 MW was set in August of 2000, and is the peak for the year ending June 2001.. The peak data for the years 1996 through 2001 are shown in Exhibit 3-4.

**Exhibit 3-4**  
**Summer Peak Load Comparisons 1996-2000**

1996	25,585 MW
1997	28,700 MW
1998	28,160 MW
1999	30,311 MW
2000	28,138 MW
2001	28,114 MW

A comparison of the mix of the primary energy sources for generation is shown in Exhibit 3-5 below covering the years 1988 through 1998.

**Exhibit 3-5**  
**Capacity By Type 1988 through 1998**



### 3.2.1 Baseload

As shown by the data listing the various units, there is almost 10,000 MW of nuclear and coal-fired generation on the NYISO system, and over 6,000 MW of hydro and fuels other than gas

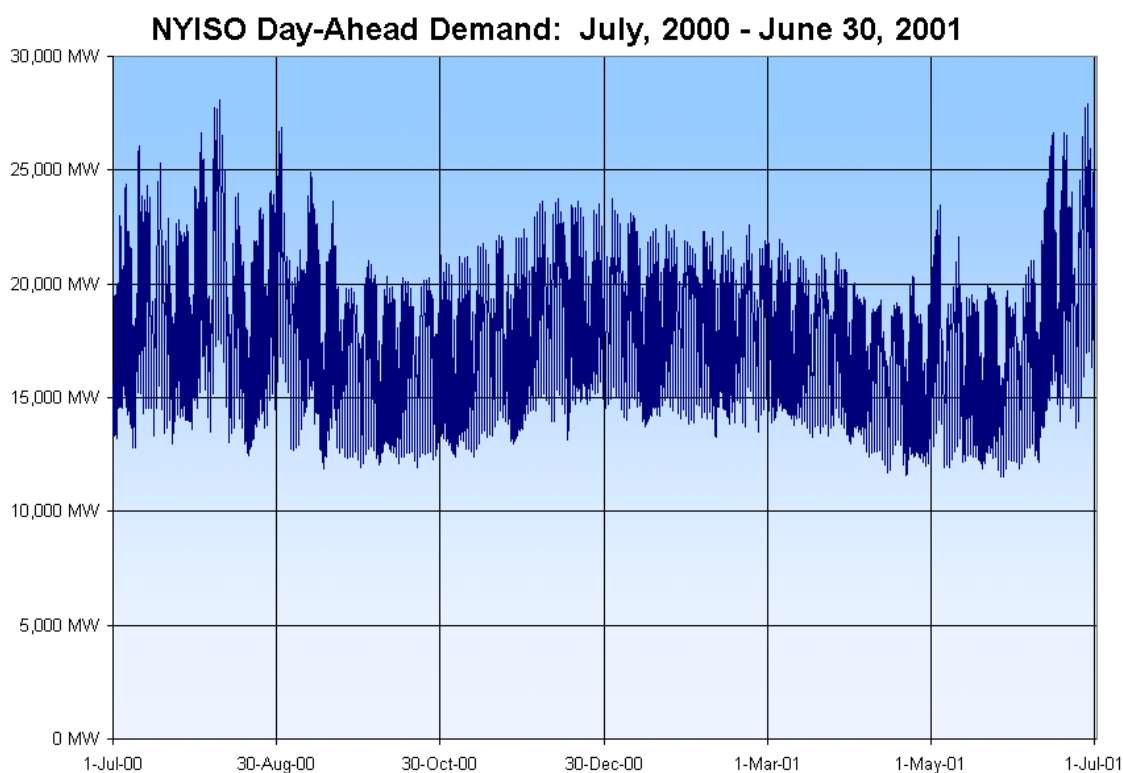
and oil. Given that the minimum load on the system is about 11,000 MW and the typical daily requirement for baseload power will range around 18,000 MW, and should be covered by hydro-electric, nuclear and coal generation. In fact, during the last year, 50 percent of the hours are below the total generation of the three types of base load generation.

### **3.2.2 Peaking**

The New York Control Area is projected to remain a summer peaking system with an annual peak demand growth rate of 0.9% in the near term (2000 – 2004). The NYISO forecasts for the Capability Year commencing May 1, 2001 is 30,620 MW which, with the required Installed Reserve Margin (IRM) of 18%, develops an Installed Capacity (ICAP) of 36,132 MW. With a projected in state installed capacity of 36,044 MW for June 2001 there is a short fall of 88 MW to be covered by import. On a locational basis, all areas except New York City and Long Island have a good ratio of installed capacity plus import capability to load. These two areas need consideration regarding the NPCC (Northeast Power Coordinating Council) Loss of load expectation (LOLE) criteria of one day in ten years. With expected conditions, New York City will meet the criteria for 2001 but will require additional resources in 2002, unless load growth abates. To comply with the LOLE the present ICAP of 107% of Peak Load for Long Island was reduced to 98%.

For the last 12 months, Exhibit 3-6 shows the hourly demands for the period July 2000 through June 2001.

### Exhibit 3-6 Hourly Demands



As shown, there are periods of peaks in the summer months, followed by relatively stable periods of daily spikes at reasonable levels during the other months of the year.

## 3.3 Price Duration

The curves that follow show the average hourly day-ahead prices of the NYISO Zone, that is, the average prices posted for every hour over the period from July 2000 through June 2001. These data are posted by NYISO, from their Internet file transfer protocol web site:

<http://mis.nyiso.com/public/P-2Alist.htm>

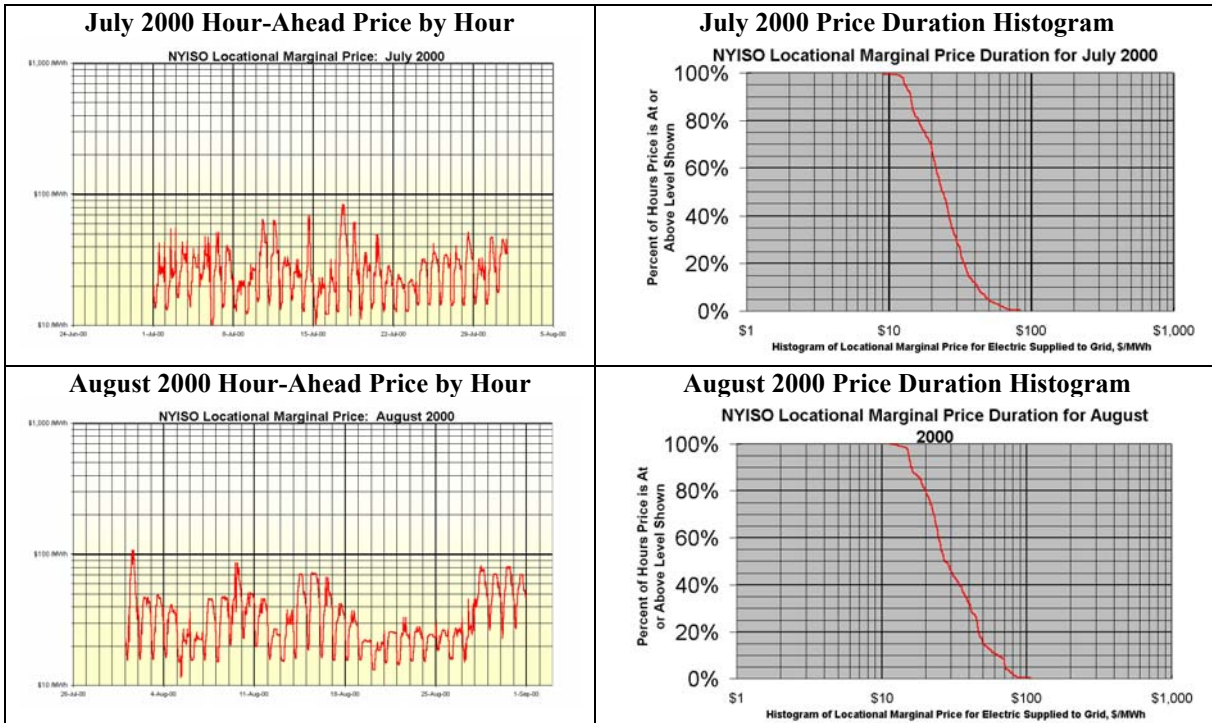
These data are listed on an hour-by-hour basis. The GEMSET team collected these data, then sorted them into a price duration histogram for each month. The data for an entire year's span was then developed. The results of this assessment are presented in the subsections that follow.

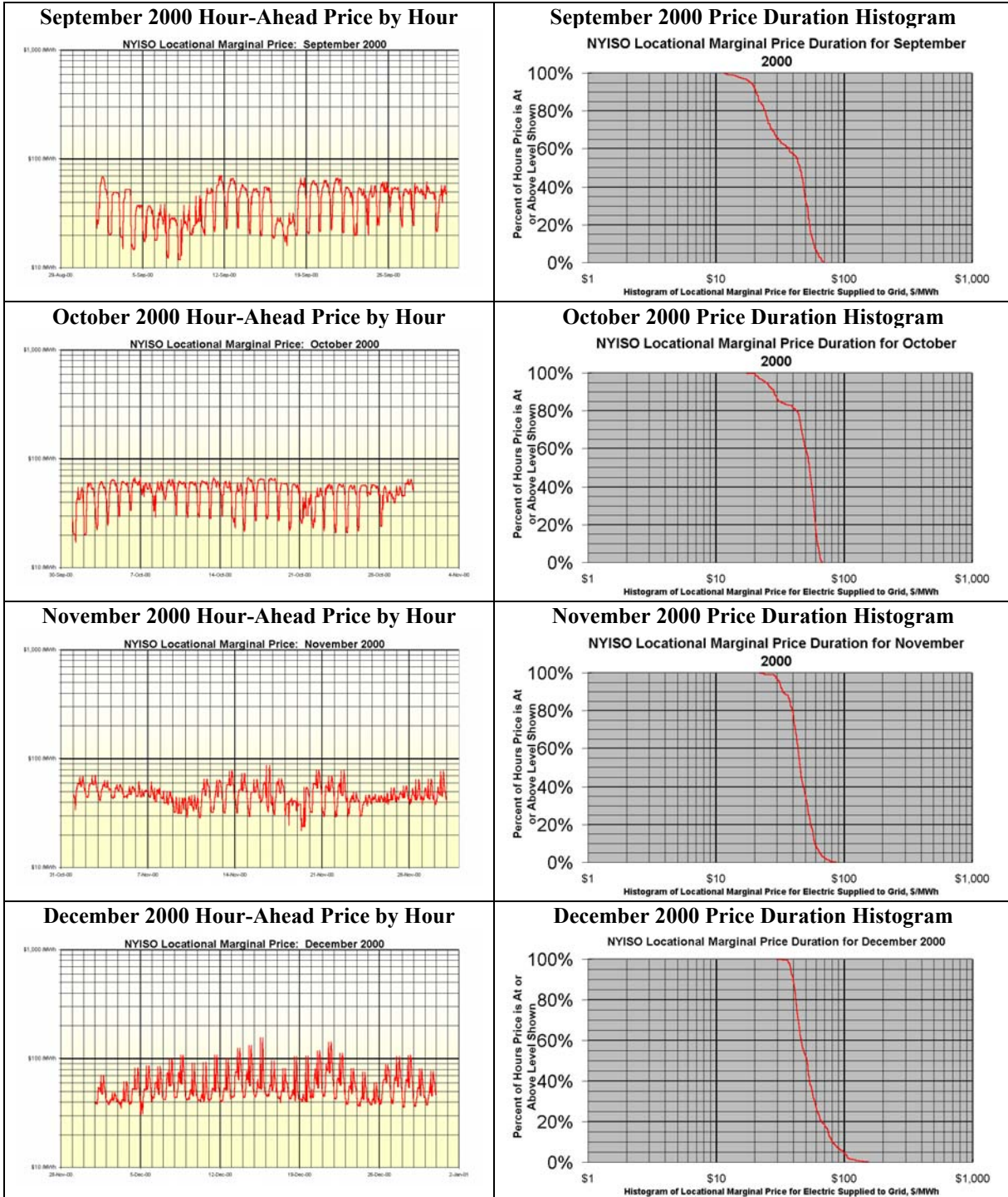


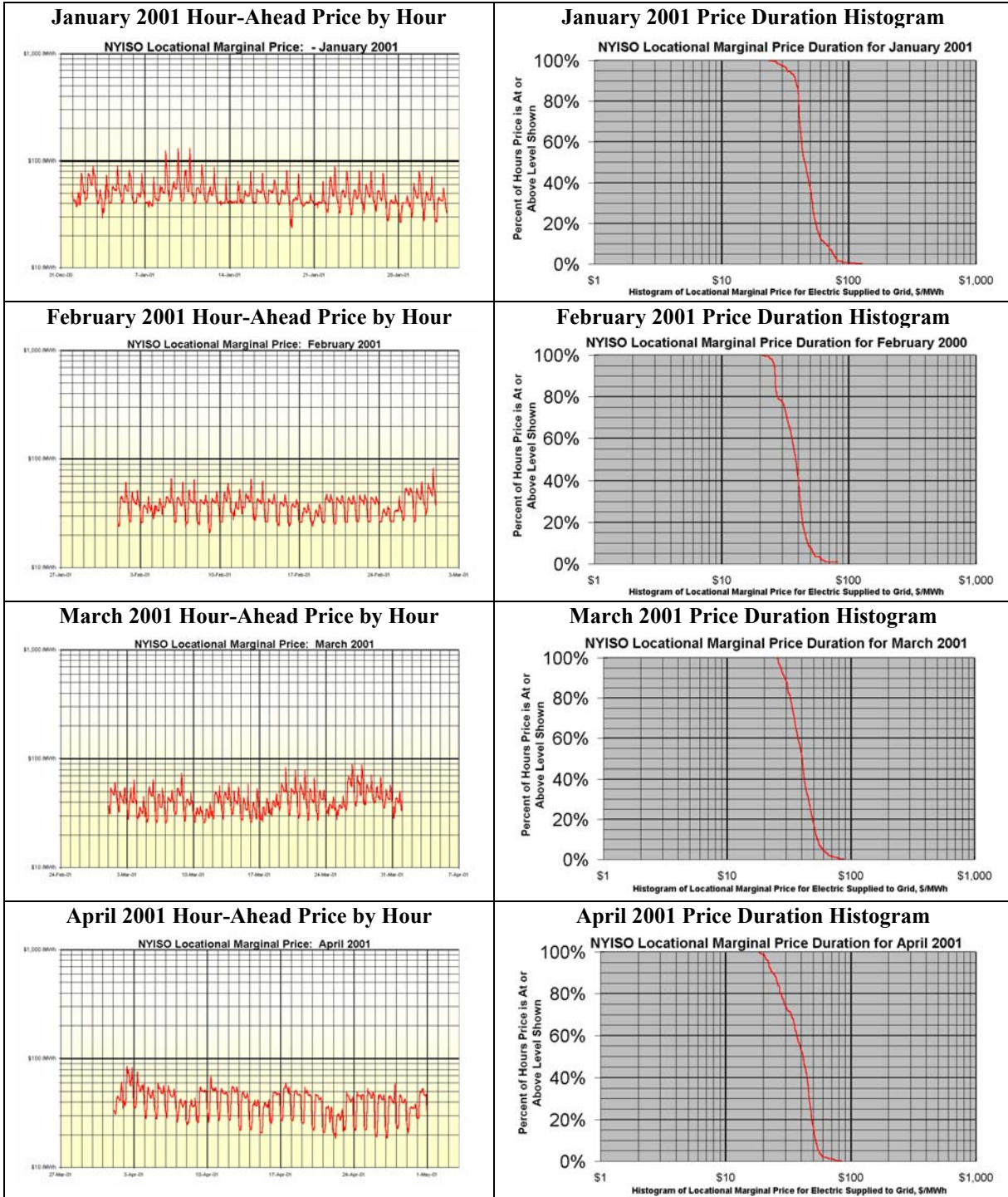
### 3.3.1 By Month

The GEMSET team took NYISO Interconnection hour-ahead locational based marginal price data from their Internet web site, and developed price duration curves for NYISO. These were for the NYISO Zone, which averages the prices at all of the hubs. Exhibit 3-7 below shows the month-by-month data for a one-year period.

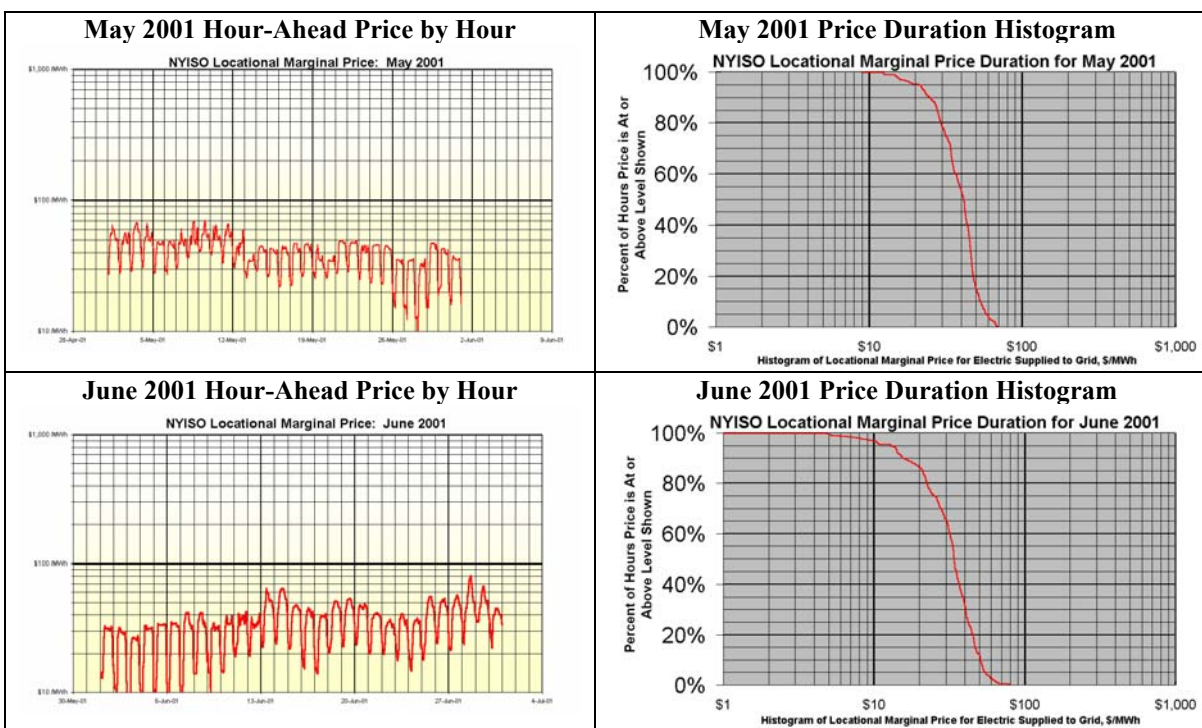
**Exhibit 3-7**  
**Monthly Hour-by-Hour NYISO Day-Ahead Market Prices, and Price Duration**  
**Histograms - October 1999-September 2000**











### 3.3.2 Characterization of One-Year's Data

A composite of the month-by-month data was assembled that gives one year's worth of data. This is shown in an annual price duration curve, Exhibit 3-9 NYISO Price Duration Histogram July 2000 – June 2001. Exhibit 3-8 shows the price demand profile for this one-year period. The increase in electric prices have been primarily attributable to:

- Significant increases in natural gas and oil prices.
- The outage of one gigawatt of nuclear capacity in Eastern New York at the Indian Point 2 Power Plant.
- Other major factors contributing include 500 MW derating of the PJM interface and under-utilization of the New England interface.

In Exhibit 3-10, the graph depicts the most recent one-year of prices for NYISO and their relationship to the demands in the region.

**Exhibit 3-8 Hourly Prices for the Most Recent 1-Year Period**

**NYISO Locational Marginal Price: July 1, 2000 - June 30, 2001**

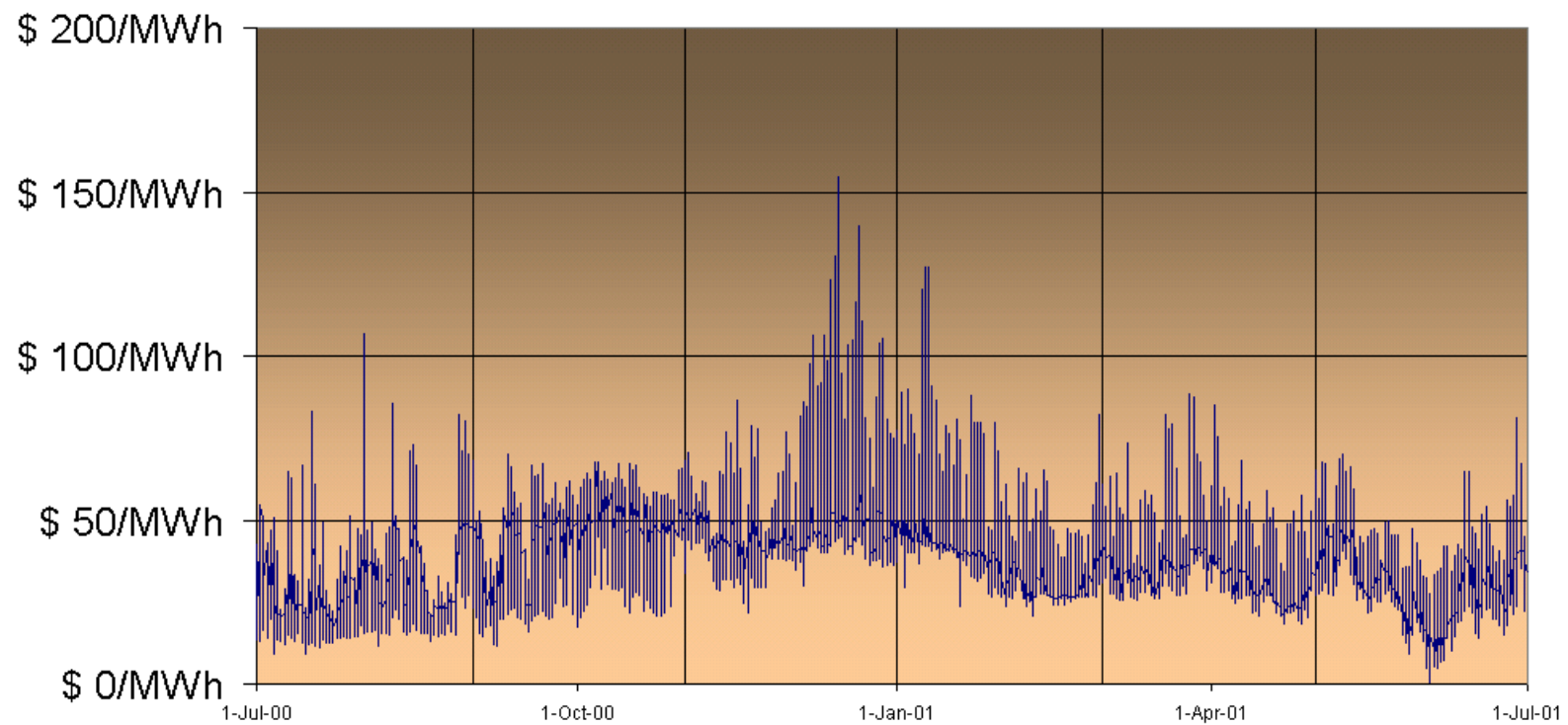
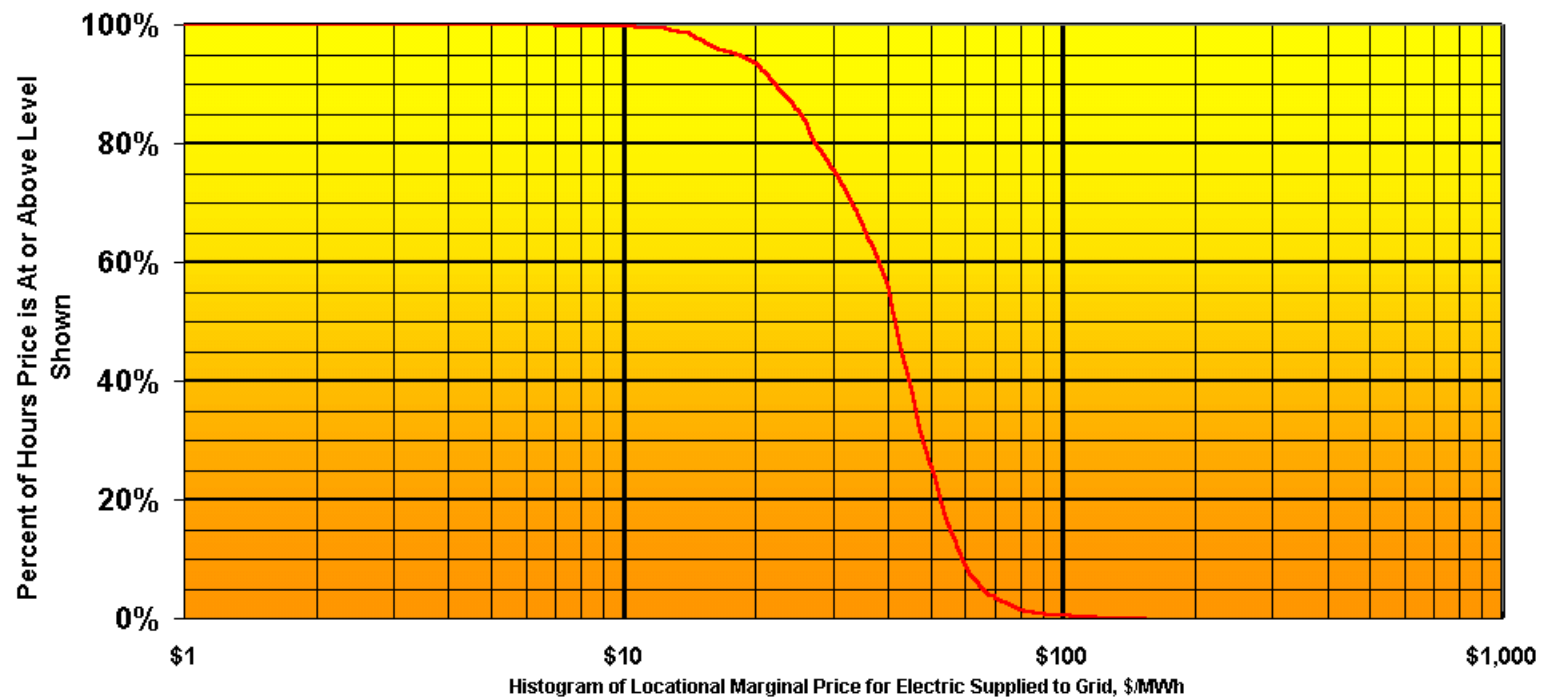
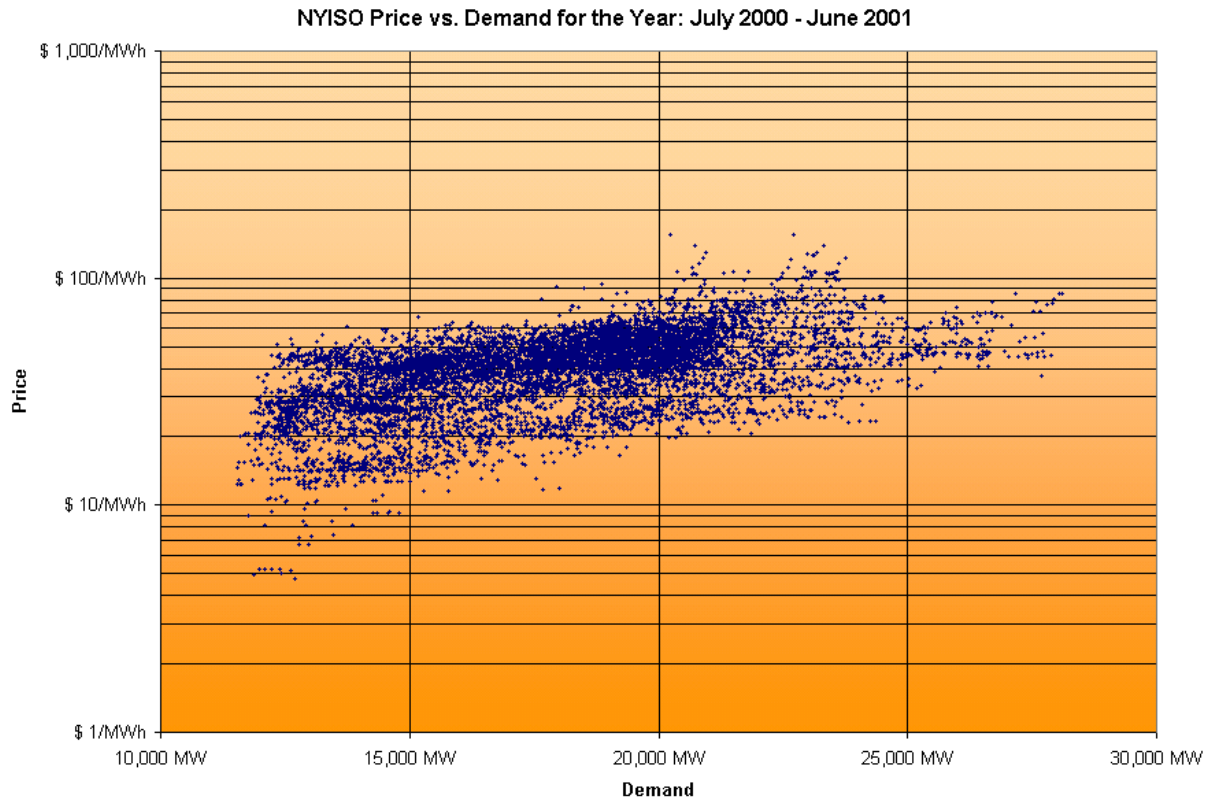


Exhibit 3-9 NYISO Price Duration Histogram July 2000 – June 2001

**NYISO Locational Marginal Price**  
July 2000-June 2001



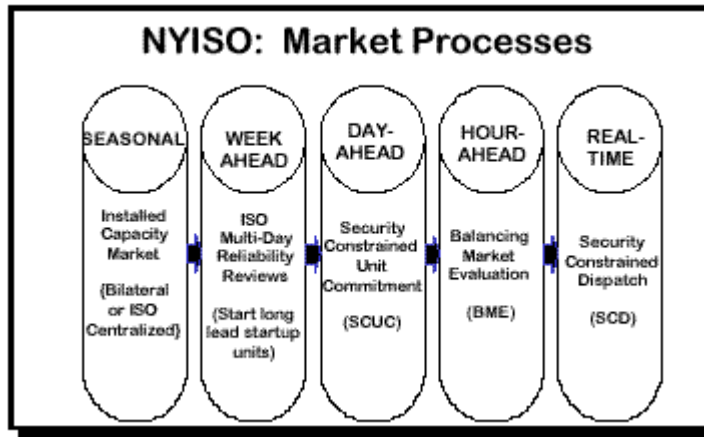
### Exhibit 3-10 Price vs. Demand Profile



## 4. Specifics of NYISO Market Operations

The NYISO market is comprised of a number of processes designed to meet the ISO's responsibility of an efficient reliable electric supply. These Processes include a seasonal planning process, a week ahead operation, a day ahead operation, an hour ahead operation and finally real-time operation. These processes are summarized in Exhibit 4-1 showing the NYISO market process.

**Exhibit 4-1  
NYISO MARKET PROCESSES SUMMARY**



### 4.1.1 Seasonal Planning Process

The first step in the annual planning process has the Load Serving Entities (LSE's) forecast their peak load requirement for the year and this is translated into an ICAP requirement for each of them. The LSE must demonstrate that it owns or has title to sufficient capacity to meet its yearly obligation. The capacity can be met through ownership, bilateral contracts, or through an auction facilitated by the NYISO. Installed Capacity providers are required to schedule bilateral transactions or submit bids to serve the NYCA load into the NYISO's Day Ahead Market (DAM).

### 4.1.2 Week Ahead Operation

Bid data sufficient for seven days of operation is requested by the NYISO. Only commitments for the next day are financially binding and the remainder of the bids are examined for security



purposes. By confirming the capacity available for the next six days the NYISO determines whether it needs to take additional action. If a shortfall is predicted from the six days of data, the NYISO can:

- Notify the market relative to the shortage
- Purchase additional reserves
- Select a long lead startup unit (one requiring more than 24 hours to start and synchronize to the power system) to place into service

This insures that there will always be enough resources to solve a viable day-ahead commitment.

### **4.1.3 Day-Ahead Operation**

The Day Ahead unit commitment process is designed to secure the power capability for the next 24 hours. The process uses a software package that provides a combination of economics and security in establishing the winning bid selection in the DAM. This software known as Security Constrained Unit Commitment (SCUC) accounts for both transmission limitations and bottlenecks on the system.

### **4.1.4 Hour Ahead Operation**

The NYISO dispatchers use a Balancing Market Evaluation (BME) tool to evaluate proposed schedule modifications and additional bids submitted by the market 90 minutes in advance of the hour in question. Logic identical to that used by the SCUC facilitates the HAM (hour ahead market) or BME process. It is differentiated from the SCUC by:

- 3 hour optimization in place of 24 hours
- load forecast updated for current conditions
- network configuration that reflects current conditions

The results of the BME are advisory and if additional capacity not committed in the DAM is required then minimum run and startup guarantees are given to additional units. The BME is assured that sufficient resources are there in real time.

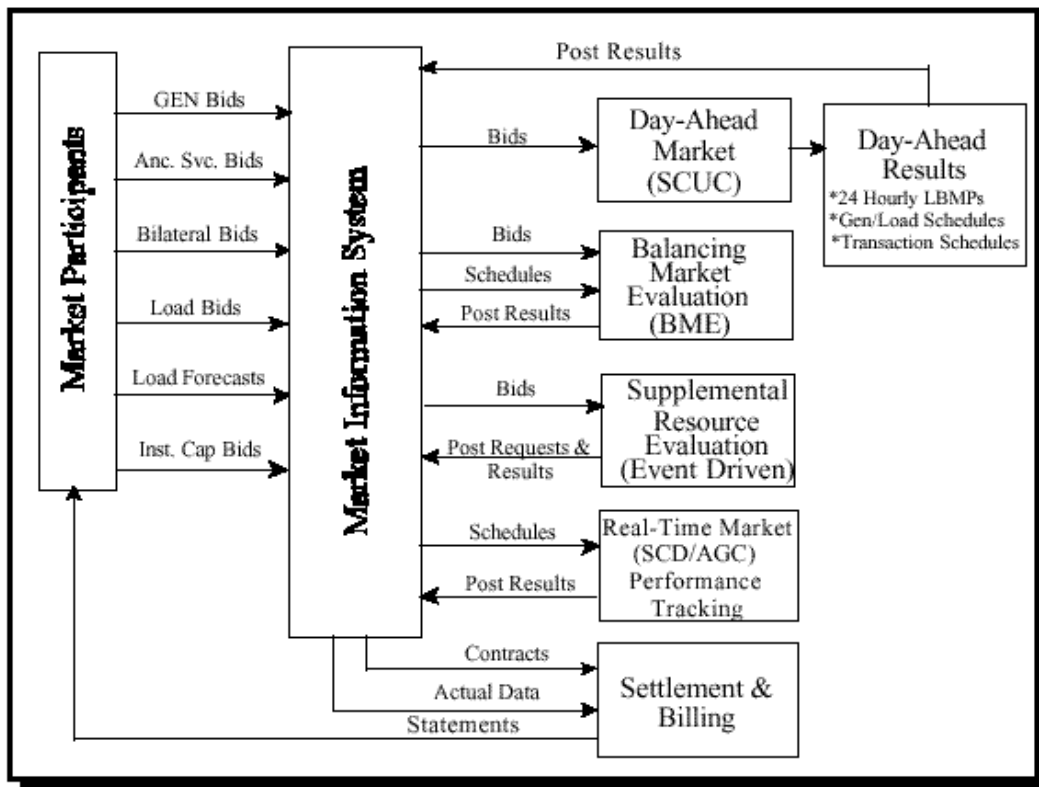
In the event of a system disturbance or a significant outage in the hour, the NYISO has a supplemental commitment processes to make corrections that can not wait until the next BME.

### 4.1.5 Real time Operation

The Security Constrained Dispatch (SCD) is the core of the real-time operation. It adjusts the system automatically (without excessive human intervention or judgement) to match real time constraints. The operations in the preceding paragraphs assure that sufficient dispatchable resources are available.

Parameters extracted from the SCD results are used to calculate LBMP's for the real time markets. Market participants will make settlements with the ISO based on real-time prices for differences between real-time operation and that scheduled day-ahead. The process by which these market settlements are determined are summarized in Exhibit 4-2 summarizing the process from bidding through Settlement and Billing.

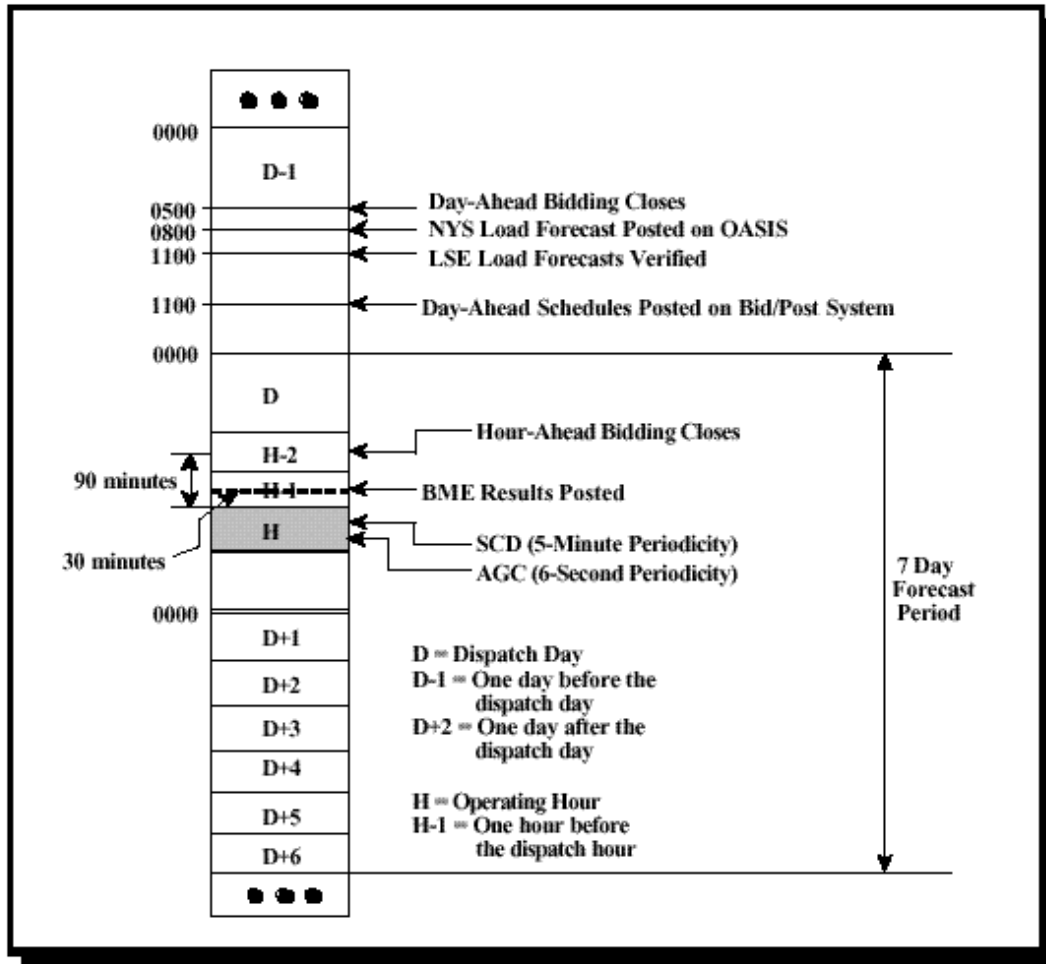
**Exhibit 4-2  
Market and Settlement Process**



### 4.1.6 Market Time Line

Energy and other related services are offered through a competitive bidding process which is administered and facilitated by the NYISO. Although bids can be entered at any time up to 15 days in advance the DAM and HAM have specific closing times. The following Exhibit 4-3 outlines the time line of events for the above market operations.

**Exhibit 4-3  
Market Time Line**



### 4.1.7 Bid Sources Versus Bid Market

The various forms of energy including supply, reserve, and regulation are bid into the market as shown in Exhibit 4-4.

**Exhibit 4-4**  
**Bid sources by Market**

	Energy	Reserve	Regulation	Comments
Day-Ahead	Day-Ahead Bids	Day-Ahead Bids	Day-Ahead Bids	Day-ahead bids that are honored in the commitment process include start-up times. When selected, day-ahead unit hourly schedules are copied to the proper hours of the hour-ahead market tables and become "Must Run" in BME.
Supplemental Resource Evaluation (SRE)	Uncommitted Day-Ahead Bids	Uncommitted Day-Ahead Bids	Uncommitted Day-Ahead Bids	For the given period, bids are selected from those unselected day ahead bids that have not expired. Bids may be entered or modified after market closes. Start-up times are honored.
Hour-Ahead Market (BME)	Hour-Ahead Bids			By bidding into this market, units have agreed that they will start with 30 minute notice if selected. Start-up times are not considered.
Supplemental Resource Evaluation (SRE)	Uncommitted Hour-Ahead Bids	Uncommitted Hour-Ahead Bids	Uncommitted Hour-Ahead Bids	For the current hour, bids are selected from unselected hour-ahead bids. All hour-ahead bids are valid from market close through the schedule hour. Start-up times up to 30 minutes are honored.

## **5. Generation in NYISO**

This section discusses how electric generation capacity is managed within NYISO, and how the owners of that capacity are compensated.

### **5.1 Generator Compensation**

Generating resources selected to run for the next day are paid at the hourly locational based marginal price (LBMP) for their generation bus at the settlement time of the day-ahead market. This day-ahead financial credit is adjusted for actual performance during the real-time market based on actual hourly average LBMP. Generating resources that self-schedule regulation capability are compensated via credit against charges for they would incur for these services. They are compensated at the market clearing price (MCP) plus an Availability payment. Units that are bid into the regulation market are compensated at the higher value of either MCP or the regulation bid plus lost opportunity cost. Other ancillary services markets may be developed by NYISO in the future.

### **5.2 Reactive Supply and Voltage Support Service**

Generators that serve as NYISO as suppliers of Voltage Support Service to qualify must provide a resource that has an AVR and has successfully performed Reactive Power (MVar) capability testing. Voltage Support Service includes the ability to produce or absorb Reactive Power within the resource's tested reactive capability, and the ability to maintain a specific voltage level under both steady-state and post contingency operating conditions subject to the limit of the resources tested reactive capability. Payment for Voltage Support Service is developed based on an embedded cost. Payments are made on a monthly basis and are one twelfth of the embedded cost if the supplier is under contract to supply installed capacity. If they are not under contract the same payment is prorated by number of hours the Generator or synchronous condenser is operated in that month. A supplier that is providing Voltage Support Service from a Generator that is in service is entitled to receive lost opportunity cost (LOC) if it is directed to reduce output to allow the unit to produce or absorb reactive power.

## 5.3 Regulation and Frequency Response Service

Regulation and frequency response services are required for continuous balancing of resources. This service is accomplished by committing on-line generators whose output is raised or lowered primarily through AGC to follow moment by moment changes in load. Regulation service is bid into the market by individual units that have AGC capability. Generating Resources have the option to bid this service and provide it if the bid is accepted. Bids are selected in the Day Ahead Market and in the Balancing Market when only when required. Providers of regulation services are compensated via:

- An hourly availability payment for reserving capability to provide regulation service based on a MCP determined by the NYISO
- An energy payment based on the amount of regulation provided is developed on based on the performance. This payment is calculated using a number of factors including the the average automatic generation control (AAGC) signal sent to the unit, the ramped security constrained dispatch (ramped SCD) and the LBMP.
- A financial penalty based on poor performance as measure against expectations.

## 5.4 Operating Reserve Service

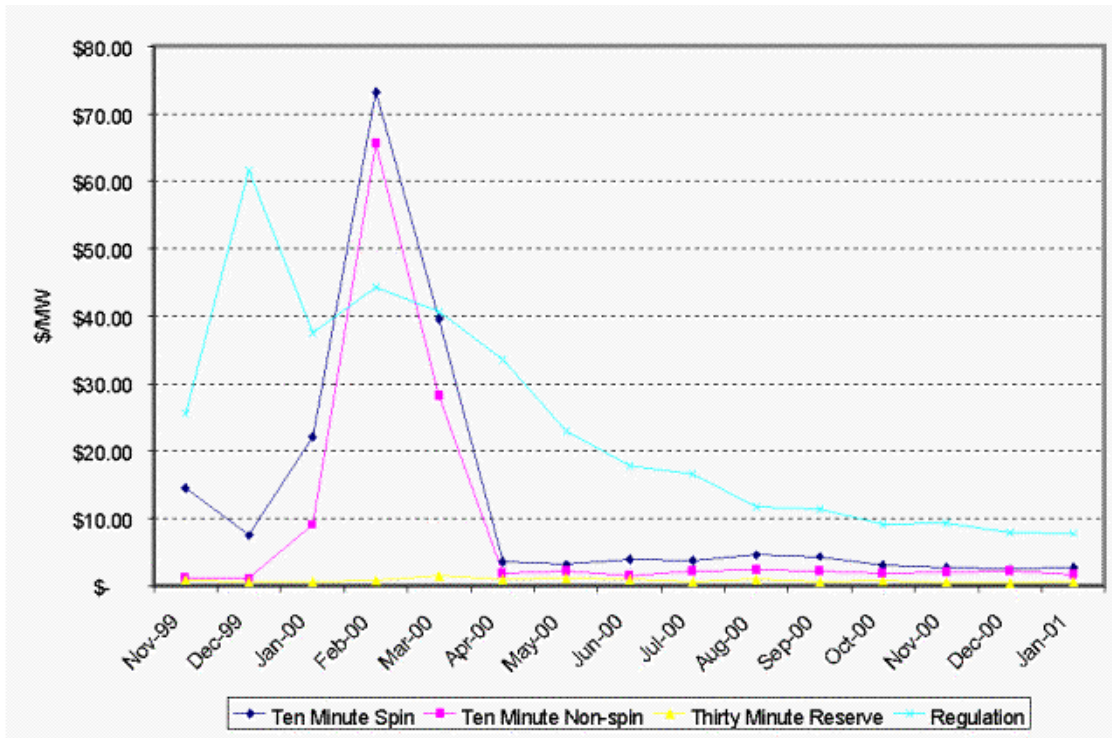
Operating Reserve Service provides backup generation in the event that major Generating Resources trip off-line. These reserves must be available from units within the NY Control Area and within specific regions. Types of reserves include:

- 10-Minute Spinning Reserve: Operating reserves that are already synchronized to the NY Power system and can respond to instructions to change output level within 10 minutes. Suppliers of this 10 Minute Spinning Reserve service are paid:
  - ◆ The Day Ahead Availability price (equal to the highest bid price accepted for the service) in each hour times the hours they are scheduled to supply the service.
  - ◆ For any excess provided beyond that scheduled from the supplier. It is paid at the Real Time Availability price in lieu of the Day Ahead Availability price.
  - ◆ Lost opportunity costs. Suppliers where Class A unit output (Real-Time dispatch) has been reduced to create spinning reserve are also paid for LOC.
  - ◆ Real Time LBMP by the NYISO for all energy generated in accordance with their instructions.

- 10-Minute Non-Synchronized Reserve: Operating reserves that can be started, synchronized and loaded within 10 minutes. Suppliers of this 10 Minute Non – Synchronized Reserve service are paid:
  - ◆ The Day Ahead Availability price (equal to the highest bid price accepted for the service) in each hour times the hours they are scheduled to supply the service.
  - ◆ For any excess provided beyond that scheduled from the supplier. It is paid at the Real Time Availability price in lieu of the Day Ahead Availability price.
  - ◆ Real Time LBMP by the NYISO for all energy generated in accordance with their instructions.
- 30-Minute Spinning Reserve: Operating reserves that are already synchronized to the NY Power System. Suppliers of this 30-Minute Spinning Reserve service are paid:
  - ◆ The Day Ahead Availability price (equal to the highest bid price accepted for the service) in each hour times the hours they are scheduled to supply the service.
  - ◆ For any excess provided beyond that scheduled from the supplier. It is paid at the Real Time Availability price in lieu of the Day Ahead Availability price.
  - ◆ Real Time LBMP by the NYISO for all energy generated in accordance with their instructions.

The actual prices for these reserve services over the period Nov. '99 to Jan. '01 are summarized below in Exhibit 5-1.

**Exhibit 5-1**  
**DAM Monthly Ancillary Service Prices Nov. '99 to Jan. '01**



## 5.5 Black Start Capability

Black Start Capability represents the key Generators that, following a system-wide blackout, can start without the availability of an outside electric supply and are available to participate in system restoration under the control of the NYISO (and in some cases under local Transmission Owner control). Providers of Black Start Capability receive payments for this service at a rate established by the FERC which include but are not limited to:

- The embedded costs related to the units involved in this service
- The O&M cost of the units involved in this service
- Training costs related to Black Start capability.



## **5.6 Capacity Credit Markets Participation**

Generators that serve as NYISO capacity resources may submit bids to the NYISO daily capacity credit market or periodic monthly and longer-term capacity credit markets. On a daily basis, any excess capacity is required to be bid into the capacity credit market. Bids are submitted using the Internet tool “NYISO Capacity.” The computer tool enables generators to create bilateral capacity transactions or submit capacity modifications to increase or decrease the installed capacity rating of a unit. The application also allows load serving entities to enter active load management modifications, and view peak load and obligation data.

## **5.7 Coordination of Operation**

A Balancing Market Evaluation (BME) is performed for the hour in which a dispatch is to occur. The BME begins ninety (90) minutes before the beginning of the hour in which dispatch occurs. Base upon Day-Ahead commitment and updated Load forecasts and Generator schedules, BME will assess new Bids for the Location Based Marginal Pricing (LBMP) Markets and requests for new Bilateral Transaction schedules for the Dispatch Hour to which the SCUC (Security Constrained Utility Commitment) applies. BME will for the Dispatch Hour for which the SCUC applies:

- Redispatch internal generators,
- Schedule external generators,
- Schedule new bilateral transactions if feasible
- Update desired net interchanges if needed, and
- Reduce or curtail bilateral transactions with non-firm and firm transmission service as needed

Base point signals are sent from the ISO to each Generator specifying scheduled MW output for the Generator. Security constrained Dispatch (SCD) Base Point signals are typically sent on a nominal 5 minute basis and Automatic Generation Control (AGC) Base Point signals on a nominal six (6) second basis.

Generation that serve as capacity resources must initially submit design data in hard copy followed by quarterly data (monthly beginning April 2001) regarding its performance to the generator availability data system (GADS). Every month NYISO uses the most recently available 12-month history of GADS data to calculate the demand equivalent forced outage rate (EFORD) for each generating unit. This measure of unit availability is used to convert the installed capacity rating of the unit to an unforced capacity rating for use in the NYISO capacity markets for the next month. The unforced capacity rating of a unit is defined as the installed

capacity multiplied by (1-EFORd). For example, a unit with an installed capacity rating of 100 MW and an EFORd of 10 percent would have (1-EFORd) equal to 0.9, resulting in an unforced rating of 100 MW multiplied by 0.9, or 90 MW.

In addition to the initially submitted design (pedigree) data, all generator owners must submit the following monthly performance and event data into NYISO GADS by the 20th of the following month:

- **Outage Event Data** – Record of times and causes for a unit being out of service.
- **Generation Performance Data** – Monthly generation, service hours, fuel consumption.

Additional specification on submitting each type of data can be found in the NYISO GADS User Manual.

## **5.8 Generator Testing**

Generating units must be tested on a routine basis to verify their performance. Summer rating tests are conducted between June 1<sup>st</sup> through September 15<sup>th</sup>, and winter tests are conducted between November 1<sup>st</sup> through April 15<sup>th</sup>. Tests must be conducted based on NYISO DMNC test procedures, with reports submitted to NYISO not later than 60 days after the test. Description for NYISO generation member requirements can be found in the NYISO Installed Capacity Manual dated 2/15/01 and test procedures in Section 5.12.8 of the ISO Services Tariff.

## **5.9 Coordination of Operation**

Real-time coordination of operations between NYISO and the generation facility is essential for maximum efficiency. Every generator that is interconnected with and synchronized to the transmission system must coordinate its operation with NYISO and provide all necessary and requested information and equipment status to assure that the electrical system can be operated in a safe and reliable manner. This coordination encompasses, but is not limited to:

- Supplying generator net MW and MVAR output.
- Supplying frequency and voltage levels.
- Scheduling the operation and outages of facilities including synchronization and disconnection.
- Providing data required for operations and system studies.

- Notifying NYISO of any condition that inhibits its operating in a reliable manner.
- Providing documented startup and shutdown procedures including ramp-up and ramp-down.
- Following NYISO-directed plant operation during emergency and restoration conditions.
- Following NYISO-directed operation during transmission-constrained conditions.

The generator owner must develop operating principles and procedures for its facility, coordinated with NYISO requirements. The owner must also provide the necessary training and certification for appropriate employees, and provide facilities for necessary communication with NYISO.

## **5.10 Reliability and Generator Operations Under Emergency Operating Conditions**

New York's transmission system is part of interconnected grid built and operated with the redundancy to tolerate a reasonable level of disturbance while maintaining customer service. The NYSRC criteria is to maintain an 18% reserve margin requirement of available electricity. This is designed to ensure the capacity to meet peak load or to operate with an unscheduled outage. Over the past six years New York experienced an average of seven hours per year in the Major Emergency State. That is a condition in which the NYISO has determined corrective actions are required to prevent damage to the transmission system or to avoid loss of firm customer load. The centerpiece for transmission reliability relative to design and operation is the N-1 Criterion. This states that a system with N elements must operate normally and reliably without any one critical component. This results in certain critical interfaces within the system being operated well below their maximum loading levels.

The New York State Reliability Council (NYSRC) is a not for profit entity whose mission is to promote and preserve the reliability of electric service on the New York State Power System. It develops, maintains and updates the reliability rules by which the NYISO and all transmission, ancillary service, and energy and power transactions must comply. This is carried out without intent to advantage or disadvantage any Market Participant's commercial interests. Its mission also includes monitoring compliance with the Reliability Rules in consultation with the NYISO. The NYSRC is governed by 13 members which include: one representative from each of the seven current Transmission Owners, one from the Wholesale sector, one from the Large Consumers sector, one from the Municipal Electric Systems, and three not affiliated with any Market Participants.

While the smooth running of NYISO under normal circumstances is an important technical and economic function, the stable operation of the grid under abnormal circumstances and during emergencies is one of the most critical elements and responsibilities of NYISO operations. In order to maintain system reliability during emergency operations, it is critical that generators respond to directives from NYISO. During an emergency, as determined/declared by the Local Reliability Center or NYISO, NYISO requires that each generator respond as promptly as possible to all directives from the Local Reliability Center and NYISO with respect to all matters affecting the operation of the facility including, without limitation, the following:

- Thermal overload of electrical circuits (actual or contingency), and/or
- High- or low-voltage conditions (actual or contingency).

The Local Reliability Center may also direct the generator to:

- Adjust (increase or decrease) the facility energy and/or reactive output, and/or
- Connect or disconnect the facility from the NYISO electrical system and/or deviate from the prescribed voltage or reactive schedules.

During emergencies, the generator and NYISO maintain communications and contact during all NYISO or Local Reliability Center's emergency operations. When the Local Reliability Center has determined that the emergency conditions have been alleviated, the facility will be allowed to return to normal operations consistent with good operational practice. In order to safely restore the transmission system following a facility outage, the facility isolated from the NYISO electrical system must reconnect only under the direction of the Local Reliability Center.

## **5.11 Interconnecting**

NYISO is connected on all sides by other power pools that vary in their role as an ISO. NYISO is concerned where projects result in significant restraints to the movement of power from one region to another. As an example, it has been recognized for years that there is a need for another transmission corridor from the western part of Pennsylvania to the east. Within the region itself, it is the responsibility of the ISO to ensure that power moves from the generating resources to the demand centers. There are a variety of ways to move the power, and it is the decision of the NYISO as the region's ISO to ensure that it happens.

As previously discussed, the coordination of all movements is the responsibility of NYISO. This is especially true when power is moved from one region to another to take advantage of load diversity. In this manner, generation resources can be optimized based on market signals for demand and supply. It is the interconnections that allow this optimization.

## **5.12 Existing Units in NYISO**

As part of each regional characterization, the GEMSET Team collects data on each generating unit in a particular region. Below, in Exhibit 5-2, are all of the identified units currently in the NYISO. This information will be utilized to develop pricing and other information when evaluating future plans in this region. These have been stacked in the production cost order estimated by the GEMSET team using known (or estimated) heat rates, GEMSET fuel price estimates, and GEMSET estimates of other variable production costs.

**Exhibit 5-2 NYISO Unit Data**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Central Hudson Gas & Elec. Corp	DCCRA	ST	REF	8,000	8
Long Island Power Authority	Babylon (RR)	ST	REF	14,345	22
Long Island Power Authority	E. Northport (LF)	IC	MTE	0	24
Long Island Power Authority	Hempstead (RR)	ST	REF	69,678	95
Long Island Power Authority	Huntington	ST	REF	22,138	118
Long Island Power Authority	Islip(RR)	ST	REF	9,429	128
Long Island Power Authority	Oceanside (LF)	IC	MTE	1,684	130
Long Island Power Authority	Oyster Bay (LF)	IC	MTE	1,300	132
Long Island Power Authority	Smithtown (LF)	IC	MTE	1,100	133
Long Island Power Authority	Yaphank (LF)	IC	MTE	3,624	137
New York Power Authority	ADG FC	FC	REF	200	137
New York Power Authority	Photovoltaic	PV	SL	480	137
New York State Elec. & Gas Corp.	AA Dairy	IC	MTE	100	137
New York State Elec. & Gas Corp.	Cowee	ST	WD	500	138
New York State Elec. & Gas Corp.	High Acres	IC	MTE	3,200	141
New York State Elec. & Gas Corp.	Lancaster LF Ph.1	IC	MTE	1,900	143
New York State Elec. & Gas Corp.	Lancaster LF Ph.2	IC	MTE	2,100	146
New York State Electric & Gas Corp.	Boralex	ST	WD	17,800	164
New York State Electric & Gas Corp.	KES-Chateaugay	ST	WD		183
Niagara Mohawk Power Corp.	Adir-Resrcy Recry	ST	REF	12,250	196
Niagara Mohawk Power Corp.	Amer. Ref-Fuel 1	ST	REF	19,500	216
Niagara Mohawk Power Corp.	Amer. Ref-Fuel 2	ST	REF	19,500	237
Niagara Mohawk Power Corp.	Energy Tactics	IC	MTE	740	240
Niagara Mohawk Power Corp.	Harden Furniture	ST	WD	300	241
Niagara Mohawk Power Corp.	MM Albany Energy	IC	REF	1,900	245
Niagara Mohawk Power Corp.	Onondaga County	ST	REF	32,250	278
Niagara Mohawk Power Corp.	Oswego County	ST	REF	920	278
Niagara Mohawk Power Corp.	Waste Mgmt. of NY	IC	MTE	1,030	280
Orange and Rockland Utilities	Landfill G.Part19	IC	MTE	2,500	282
Orange and Rockland Utilities	Middletown LFG	IC	MTE	3,000	285
PECO Energy	Burrows-Lyonsdale	ST	WD	19,800	305
PP&L EnergyPlus Co. (EPLUS)	Bethlehem Steel	CC	COG	21,500	326
Seneca Energy_ Inc.	Seneca Energy Inc.	IC	MTE	6,000	336
Seneca Energy_ Inc.	Seneca Energy Inc.	IC	MTE	6,000	346
Westchester RESCO Co._ LP	Westchester Resco	ST	REF	54,000	400
Niagara Mohawk Power Corp.	Bannertown P&L	WT	WND	0	400
Niagara Mohawk Power Corp.	Begent_ H.A.	WT	WND	0	400
Niagara Mohawk Power Corp.	Bergan_ W.C.	WT	WND	0	400
Niagara Mohawk Power Corp.	Blenheim Wind Pwr	WT	WND	0	400
Niagara Mohawk Power Corp.	Chapman_ Jerry	WT	WND	0	400
Niagara Mohawk Power Corp.	Devine_ W.T.	WT	WND	18	400
Niagara Mohawk Power Corp.	Dibble_ C.	WT	WND	4	400
Niagara Mohawk Power Corp.	Fitzpatrick_ R.	WT	WND	2	400
Niagara Mohawk Power Corp.	Hamond_ E.	WT	WND	2	400
Niagara Mohawk Power Corp.	Hedrick_ Robert	WT	WND	10	400
Niagara Mohawk Power Corp.	Helmer_ Paul	WT	WND	4	400
Niagara Mohawk Power Corp.	Hess_ Jos.& Kath.	WT	WND	10	400
Niagara Mohawk Power Corp.	Higgins_ W.J.	WT	WND	4	400
Niagara Mohawk Power Corp.	Hurd_ Dr. D.W.	WT	WND	10	400
Niagara Mohawk Power Corp.	Lewandowski_ Paul	WT	WND	5	400
Niagara Mohawk Power Corp.	Marsden_ Russel	WT	WND	2	401
Niagara Mohawk Power Corp.	Prossner_ D.M.	WT	WND	1	401
Niagara Mohawk Power Corp.	Ryan_ Robert	WT	WND	10	401
Niagara Mohawk Power Corp.	Schiefer_ M.	WT	WND	20	401
Niagara Mohawk Power Corp.	Staples_ Gary D.	WT	WND	10	401
Niagara Mohawk Power Corp.	Stellone_ Gerald	WT	WND	4	401
Niagara Mohawk Power Corp.	Tallmon_ Larry	WT	WND	12	401
Niagara Mohawk Power Corp.	Van Strander_ J.M	WT	WND	1	401
Niagara Mohawk Power Corp.	Weber_ Richard	WT	WND	4	401
Niagara Mohawk Power Corp.	Wind Development	WT	WND	75	401
Niagara Mohawk Power Corp.	Woodin_ D.	WT	WND	1	401
Niagara Mohawk Power Corp.	Zingler_ Rudy	WT	WND	5	401
Central Hudson Gas & Elec. Corp.	Dashville 1	HY	WAT	2,250	403

**Exhibit 5-2 NYISO Unit Data (Continued)**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Central Hudson Gas & Elec. Corp.	Dashville 2	HY	WAT	2,250	405
Central Hudson Gas & Elec. Corp.	Groveville Mills	HY	WAT	800	406
Central Hudson Gas & Elec. Corp.	High Falls	HY	WAT	2,500	409
Central Hudson Gas & Elec. Corp.	Millpond	HY	WAT	900	410
Central Hudson Gas & Elec. Corp.	Montgomery West	HY	WAT	200	410
Central Hudson Gas & Elec. Corp.	Neversink	HY	WAT	23,250	434
Central Hudson Gas & Elec. Corp.	Salisbury Mills	HY	WAT	500	434
Central Hudson Gas & Elec. Corp.	Sturgeon 1	HY	WAT	5,333	439
Central Hudson Gas & Elec. Corp.	Sturgeon 2	HY	WAT	5,333	445
Central Hudson Gas & Elec. Corp.	Sturgeon 3	HY	WAT	5,334	450
Central Hudson Gas & Elec. Corp.	Wallkill	HY	WAT	500	451
Central Hudson Gas & Elec. Corp.	Wappingers Falls	HY	WAT	2,000	453
Central Hudson Gas & Elec. Corp.	West Delaware	HY	WAT	7,250	460
New York Power Authority	Ashokan 1	HY	WAT	1,900	462
New York Power Authority	Ashokan 2	HY	WAT	1,900	464
New York Power Authority	Blenheim 1	PS	WAT	260,000	724
New York Power Authority	Blenheim 2	PS	WAT	260,000	984
New York Power Authority	Blenheim 3	PS	WAT	260,000	1,244
New York Power Authority	Blenheim 4	PS	WAT	260,000	1,504
New York Power Authority	Crescent 1	HY	WAT	2,000	1,506
New York Power Authority	Crescent 2	HY	WAT	2,000	1,509
New York Power Authority	Crescent 3	HY	WAT	2,974	1,512
New York Power Authority	Crescent 4	HY	WAT	2,974	1,515
New York Power Authority	Jarvis 1	HY	WAT	2,000	1,517
New York Power Authority	Jarvis 2	HY	WAT	2,000	1,519
New York Power Authority	Kensico 1	HY	WAT	800	1,520
New York Power Authority	Kensico 2	HY	WAT	800	1,521
New York Power Authority	Kensico 3	HY	WAT	800	1,522
New York Power Authority	Lewiston PS	PS	WAT	240,000	1,762
New York Power Authority	Moses Niagara	HY	WAT	2,400,000	4,162
New York Power Authority	St Law. FDR	HY	WAT	800,000	4,962
New York Power Authority	Vischer Ferry 1	HY	WAT	2,000	4,964
New York Power Authority	Vischer Ferry 2	HY	WAT	2,000	4,967
New York Power Authority	Vischer Ferry 3	HY	WAT	2,974	4,970
New York Power Authority	Vischer Ferry 4	HY	WAT	2,974	4,973
New York State Elec. & Gas Corp.	Alice Falls	HY	WAT	1,500	4,975
New York State Elec. & Gas Corp.	Alice Falls	HY	WAT	600	4,975
New York State Elec. & Gas Corp.	Allegheny 8	HY	WAT	9,400	4,992
New York State Elec. & Gas Corp.	Allegheny 9	HY	WAT	11,800	5,012
New York State Elec. & Gas Corp.	Auburn - Mill-St.	HY	WAT	400	5,013
New York State Elec. & Gas Corp.	Auburn-No. Div.St	HY	WAT	800	5,013
New York State Elec. & Gas Corp.	Cadyville 1	HY	WAT	1,500	5,015
New York State Elec. & Gas Corp.	Cadyville 2	HY	WAT	1,500	5,016
New York State Elec. & Gas Corp.	Cadyville 3	HY	WAT	3,800	5,020
New York State Elec. & Gas Corp.	Chasm Hydro	HY	WAT	900	5,021
New York State Elec. & Gas Corp.	Croton Fall Hydro	HY	WAT	200	5,022
New York State Elec. & Gas Corp.	Goodyear Lake	HY	WAT	1,500	5,023
New York State Elec. & Gas Corp.	High Falls 1	HY	WAT	3,400	5,027
New York State Elec. & Gas Corp.	High Falls 2	HY	WAT	3,400	5,032
New York State Elec. & Gas Corp.	High Falls 3	HY	WAT	6,000	5,039
New York State Elec. & Gas Corp.	Kent Falls 1	HY	WAT	2,800	5,042
New York State Elec. & Gas Corp.	Kent Falls 2	HY	WAT	2,800	5,045
New York State Elec. & Gas Corp.	Kent Falls 3	HY	WAT	5,300	5,050
New York State Elec. & Gas Corp.	Lower Saranac	HY	WAT	6,400	5,059
New York State Elec. & Gas Corp.	Mechanicville 1	HY	WAT	8,200	5,069
New York State Elec. & Gas Corp.	Mechanicville 2	HY	WAT	8,200	5,078
New York State Elec. & Gas Corp.	Mill C 1	HY	WAT	900	5,079
New York State Elec. & Gas Corp.	Mill C 2	HY	WAT	1,100	5,080
New York State Elec. & Gas Corp.	Mill C 3	HY	WAT	3,300	5,083
New York State Elec. & Gas Corp.	Montville Falls	HY	WAT	200	5,084
New York State Elec. & Gas Corp.	Rainbow Falls 1	HY	WAT	1,500	5,085
New York State Elec. & Gas Corp.	Rainbow Falls 2	HY	WAT	1,500	5,087
New York State Elec. & Gas Corp.	Triton	HY	WAT	1,800	5,089



**Exhibit 5-2 NYISO Unit Data (Continued)**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
New York State Elec. & Gas Corp.	Walden Hydro	HY	WAT	3,700	5,093
New York State Elec. & Gas Corp.	Waterloo 2	HY	WAT	400	5,094
New York State Elec. & Gas Corp.	Waterloo 3	HY	WAT	400	5,094
New York State Elec. & Gas Corp.	Waterloo 4	HY	WAT	400	5,095
Niagara Mohawk Energy Marketing_ Inc.	Seneca Falls 1	HY	WAT	1,700	5,096
Niagara Mohawk Energy Marketing_ Inc.	Seneca Falls 2	HY	WAT	1,700	5,098
Niagara Mohawk Energy Marketing_ Inc.	Seneca Falls 4	HY	WAT	1,800	5,100
Niagara Mohawk Power Corp.	Ad.HY Potsdam Pap	HY	WAT	1,180	5,103
Niagara Mohawk Power Corp.	Adir HY Middle Fl	HY	WAT	700	5,105
Niagara Mohawk Power Corp.	Adir HY-NYS Dam	HY	WAT	10,700	5,116
Niagara Mohawk Power Corp.	Adir HY-Otter Crk	HY	WAT	90	5,116
Niagara Mohawk Power Corp.	Adir HY-Schroon R	HY	WAT	400	5,118
Niagara Mohawk Power Corp.	Adir HY-Sissonvle	HY	WAT	1,040	5,121
Niagara Mohawk Power Corp.	Adir.HY-Hudsn Fls	HY	WAT	41,750	5,165
Niagara Mohawk Power Corp.	Adir.HY-S.Glen Fl	HY	WAT	14,500	5,179
Niagara Mohawk Power Corp.	Albany Hydro Assc	HY	WAT	20	5,179
Niagara Mohawk Power Corp.	Algon.-Cran. Lake	HY	WAT	70	5,180
Niagara Mohawk Power Corp.	Algon.-Forresport	HY	WAT	300	5,182
Niagara Mohawk Power Corp.	Algonquin-Adams	HY	WAT	10	5,182
Niagara Mohawk Power Corp.	Algonquin-Chr.Fl	HY	WAT	140	5,183
Niagara Mohawk Power Corp.	Algonquin-Herkimr	HY	WAT	390	5,184
Niagara Mohawk Power Corp.	Algonquin-Kayuta	HY	WAT	80	5,184
Niagara Mohawk Power Corp.	Algonquin-Ogdenbg	HY	WAT	430	5,186
Niagara Mohawk Power Corp.	Azure Mnt. Pwr Co	HY	WAT	130	5,186
Niagara Mohawk Power Corp.	Beaver Falls #1	HY	WAT	860	5,188
Niagara Mohawk Power Corp.	Beaver Falls #2	HY	WAT	460	5,189
Niagara Mohawk Power Corp.	Bellows Towers	HY	WAT	110	5,189
Niagara Mohawk Power Corp.	Black River Hyd#1	HY	WAT	0	5,190
Niagara Mohawk Power Corp.	Black River Hyd#2	HY	WAT	420	5,190
Niagara Mohawk Power Corp.	Black River Hyd#3	HY	WAT	640	5,194
Niagara Mohawk Power Corp.	C.H.I. (#3 Mill)	HY	WAT	340	5,194
Niagara Mohawk Power Corp.	Carthage Paper	HY	WAT	90	5,194
Niagara Mohawk Power Corp.	Champlain Spinner	HY	WAT	20	5,195
Niagara Mohawk Power Corp.	CHI Dexter Hydro	HY	WAT	1,220	5,198
Niagara Mohawk Power Corp.	CHI Diamond Is HY	HY	WAT	320	5,199
Niagara Mohawk Power Corp.	CHI Fowler	HY	WAT	520	5,200
Niagara Mohawk Power Corp.	CHI Hallsboro #4	HY	WAT	840	5,201
Niagara Mohawk Power Corp.	CHI Hallsboro #6	HY	WAT	380	5,201
Niagara Mohawk Power Corp.	CHI Theresa Hydro	HY	WAT	430	5,203
Niagara Mohawk Power Corp.	CHI-Lachute	HY	WAT	1,240	5,204
Niagara Mohawk Power Corp.	Chittenden Falls	HY	WAT	150	5,205
Niagara Mohawk Power Corp.	City of Watervliet	HY	WAT	20	5,206
Niagara Mohawk Power Corp.	City of Oswego (H.D.)	HY	WAT	7,000	5,214
Niagara Mohawk Power Corp.	City of Utica 1	HY	WAT	100	5,214
Niagara Mohawk Power Corp.	City of Utica 2	HY	WAT	150	5,214
Niagara Mohawk Power Corp.	City of Watertown	HY	WAT	1,250	5,219
Niagara Mohawk Power Corp.	Cons. HY-Victory	HY	WAT	100	5,220
Niagara Mohawk Power Corp.	Copenhagen Assoc.	HY	WAT	620	5,223
Niagara Mohawk Power Corp.	Cottrell Paper	HY	WAT	30	5,223
Niagara Mohawk Power Corp.	Daniel Green	HY	WAT	10	5,223
Niagara Mohawk Power Corp.	DD Corp-Diana	HY	WAT	450	5,224
Niagara Mohawk Power Corp.	DD Corp-Dolgevle	HY	WAT	4,000	5,231
Niagara Mohawk Power Corp.	Empire HY Partner	HY	WAT	290	5,232
Niagara Mohawk Power Corp.	Finch Pruyn	HY	WAT	4	5,235
Niagara Mohawk Power Corp.	Fort Miller Assoc	HY	WAT	1,550	5,239
Niagara Mohawk Power Corp.	Franklin Hydro	HY	WAT	130	5,240
Niagara Mohawk Power Corp.	Glen Park Assoc.	HY	WAT	36,500	5,281
Niagara Mohawk Power Corp.	Glovers Mill Enr	HY	WAT	0	5,281
Niagara Mohawk Power Corp.	Hampshire Paper	HY	WAT	1,160	5,284
Niagara Mohawk Power Corp.	Harza Moose River	HY	WAT	12,000	5,296
Niagara Mohawk Power Corp.	Harza Philadelphia	HY	WAT	2,080	5,299
Niagara Mohawk Power Corp.	Hollings&Vose Ct	HY	WAT	150	5,300
Niagara Mohawk Power Corp.	Hollings&Vose Lw	HY	WAT	10	5,301

**Exhibit 5-2 NYISO Unit Data (Continued)**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Niagara Mohawk Power Corp.	Hollings&Vose Up	HY	WAT	300	5,302
Niagara Mohawk Power Corp.	Hoosick Falls	HY	WAT	310	5,303
Niagara Mohawk Power Corp.	Indian Falls HY	HY	WAT	70	5,303
Niagara Mohawk Power Corp.	International Paper 1	HY	WAT	22,300	5,332
Niagara Mohawk Power Corp.	International Paper 2	HY	WAT	22,300	5,360
Niagara Mohawk Power Corp.	James River Corp.	HY	WAT	0	5,360
Niagara Mohawk Power Corp.	Kings Falls	HY	WAT	80	5,361
Niagara Mohawk Power Corp.	Lake Flower-Sarnic	HY	WAT	20	5,361
Niagara Mohawk Power Corp.	Laquidara-Long Fl	HY	WAT	310	5,363
Niagara Mohawk Power Corp.	Little Falls Hyd.	HY	WAT	12,000	5,376
Niagara Mohawk Power Corp.	Lyonsdale Assoc.	HY	WAT	640	5,380
Niagara Mohawk Power Corp.	Lyonsfalls Pulp&Pa	HY	WAT	290	5,380
Niagara Mohawk Power Corp.	Modular HY Mil Cr	HY	WAT	10	5,380
Niagara Mohawk Power Corp.	Mohawk Paper	HY	WAT	490	5,383
Niagara Mohawk Power Corp.	Moreau Mfg	HY	WAT	2,090	5,386
Niagara Mohawk Power Corp.	Mt. Ida Assoc.	HY	WAT	180	5,388
Niagara Mohawk Power Corp.	Newport HY Assoc	HY	WAT	530	5,389
Niagara Mohawk Power Corp.	Oswego HY Partnrs	HY	WAT	2,000	5,391
Niagara Mohawk Power Corp.	Pyrites Assoc.	HY	WAT	5,250	5,398
Niagara Mohawk Power Corp.	Riverrat Glass&Electric	HY	WAT	120	5,399
Niagara Mohawk Power Corp.	Sandy Hollow HY	HY	WAT	240	5,399
Niagara Mohawk Power Corp.	Seneca Limited	HY	WAT	160	5,401
Niagara Mohawk Power Corp.	SNC-Burt Dam Assc	HY	WAT	210	5,402
Niagara Mohawk Power Corp.	SNC-Hollow Dam	HY	WAT	290	5,402
Niagara Mohawk Power Corp.	Stevens&Thompson	HY	WAT	250	5,411
Niagara Mohawk Power Corp.	Stillwater Assoc.	HY	WAT	910	5,412
Niagara Mohawk Power Corp.	Stillwater HY Prt	HY	WAT	1,180	5,416
Niagara Mohawk Power Corp.	Synergics M.Grnwh	HY	WAT	160	5,416
Niagara Mohawk Power Corp.	Synergics U.Grnwh	HY	WAT	70	5,416
Niagara Mohawk Power Corp.	Synergics-Union F	HY	WAT	570	5,419
Niagara Mohawk Power Corp.	Tannery Island	HY	WAT	980	5,420
Niagara Mohawk Power Corp.	Town of Wells	HY	WAT	70	5,421
Niagara Mohawk Power Corp.	Valatie Falls	HY	WAT	40	5,421
Niagara Mohawk Power Corp.	Valley Falls Assoc.	HY	WAT	560	5,423
Niagara Mohawk Power Corp.	Vill. Gouverneur	HY	WAT	20	5,423
Niagara Mohawk Power Corp.	Vill. of Potsdam	HY	WAT	460	5,423
Niagara Mohawk Power Corp.	Watertown-Beebee.	HY	WAT	9,000	5,432
Niagara Mohawk Power Corp.	West End Dam Assc	HY	WAT	1,720	5,436
Niagara Mohawk Power Corp.	William Allen	HY	WAT	0	5,436
Orange and Rockland Utilities	Buttermilk Falls	HY	WAT	100	5,437
Orion Power Holdings_ Inc.	Allens Falls	HY	WAT	4,000	5,441
Orion Power Holdings_ Inc.	Baldwinsville 1	HY	WAT	150	5,441
Orion Power Holdings_ Inc.	Baldwinsville 2	HY	WAT	150	5,441
Orion Power Holdings_ Inc.	Beardslee 1	HY	WAT	7,900	5,449
Orion Power Holdings_ Inc.	Beardslee 2	HY	WAT	7,900	5,457
Orion Power Holdings_ Inc.	Beebee Island 1	HY	WAT	3,300	5,460
Orion Power Holdings_ Inc.	Beebee Island 2	HY	WAT	3,300	5,464
Orion Power Holdings_ Inc.	Belfort 1	HY	WAT	667	5,464
Orion Power Holdings_ Inc.	Belfort 2	HY	WAT	667	5,465
Orion Power Holdings_ Inc.	Belfort 3	HY	WAT	667	5,466
Orion Power Holdings_ Inc.	Bennetts Bridge 1	HY	WAT	4,025	5,473
Orion Power Holdings_ Inc.	Bennetts Bridge 2	HY	WAT	4,025	5,481
Orion Power Holdings_ Inc.	Bennetts Bridge 3	HY	WAT	4,025	5,488
Orion Power Holdings_ Inc.	Bennetts Bridge 4	HY	WAT	4,025	5,496
Orion Power Holdings_ Inc.	Black River 1	HY	WAT	2,367	5,498
Orion Power Holdings_ Inc.	Black River 2	HY	WAT	2,367	5,500
Orion Power Holdings_ Inc.	Black River 3	HY	WAT	2,367	5,503
Orion Power Holdings_ Inc.	Blake	HY	WAT	13,730	5,518
Orion Power Holdings_ Inc.	Browns Falls 1	HY	WAT	7,900	5,526
Orion Power Holdings_ Inc.	Browns Falls 2	HY	WAT	7,900	5,534
Orion Power Holdings_ Inc.	Chasm 1	HY	WAT	867	5,535
Orion Power Holdings_ Inc.	Chasm 2	HY	WAT	867	5,536
Orion Power Holdings_ Inc.	Chasm 3	HY	WAT	867	5,537

**Exhibit 5-2 NYISO Unit Data (Continued)**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Orion Power Holdings_ Inc.	Colton 1	HY	WAT	8,793	5,547
Orion Power Holdings_ Inc.	Colton 2	HY	WAT	8,793	5,556
Orion Power Holdings_ Inc.	Colton 3	HY	WAT	8,793	5,566
Orion Power Holdings_ Inc.	Deferiet 1	HY	WAT	3,533	5,569
Orion Power Holdings_ Inc.	Deferiet 2	HY	WAT	3,533	5,573
Orion Power Holdings_ Inc.	Deferiet 3	HY	WAT	3,533	5,577
Orion Power Holdings_ Inc.	E J West 1	HY	WAT	11,000	5,588
Orion Power Holdings_ Inc.	E J West 2	HY	WAT	11,000	5,599
Orion Power Holdings_ Inc.	Eagle 1	HY	WAT	1,400	5,600
Orion Power Holdings_ Inc.	Eagle 2	HY	WAT	1,400	5,601
Orion Power Holdings_ Inc.	Eagle 3	HY	WAT	1,400	5,603
Orion Power Holdings_ Inc.	Eagle 4	HY	WAT	1,400	5,604
Orion Power Holdings_ Inc.	East Norfolk	HY	WAT	3,500	5,608
Orion Power Holdings_ Inc.	Eel Weir 1	HY	WAT	400	5,608
Orion Power Holdings_ Inc.	Eel Weir 2	HY	WAT	400	5,609
Orion Power Holdings_ Inc.	Eel Weir 3	HY	WAT	400	5,610
Orion Power Holdings_ Inc.	Effley 1	HY	WAT	400	5,610
Orion Power Holdings_ Inc.	Effley 2	HY	WAT	485	5,611
Orion Power Holdings_ Inc.	Effley 3	HY	WAT	727	5,611
Orion Power Holdings_ Inc.	Effley 4	HY	WAT	1,889	5,613
Orion Power Holdings_ Inc.	Elmer 1	HY	WAT	950	5,614
Orion Power Holdings_ Inc.	Elmer 2	HY	WAT	950	5,615
Orion Power Holdings_ Inc.	Ephratah 1	HY	WAT	750	5,616
Orion Power Holdings_ Inc.	Ephratah 2	HY	WAT	750	5,617
Orion Power Holdings_ Inc.	Ephratah 3	HY	WAT	750	5,618
Orion Power Holdings_ Inc.	Ephratah 4	HY	WAT	750	5,619
Orion Power Holdings_ Inc.	Feeder Dam 1	HY	WAT	840	5,620
Orion Power Holdings_ Inc.	Feeder Dam 2	HY	WAT	840	5,621
Orion Power Holdings_ Inc.	Feeder Dam 3	HY	WAT	840	5,622
Orion Power Holdings_ Inc.	Feeder Dam 4	HY	WAT	840	5,623
Orion Power Holdings_ Inc.	Feeder Dam 5	HY	WAT	840	5,624
Orion Power Holdings_ Inc.	Five Falls	HY	WAT	22,000	5,648
Orion Power Holdings_ Inc.	Flat Rock 1	HY	WAT	2,400	5,650
Orion Power Holdings_ Inc.	Flat Rock 2	HY	WAT	2,400	5,653
Orion Power Holdings_ Inc.	Franklin 1	HY	WAT	1,100	5,654
Orion Power Holdings_ Inc.	Franklin 2	HY	WAT	1,100	5,655
Orion Power Holdings_ Inc.	Fulton 1	HY	WAT	400	5,655
Orion Power Holdings_ Inc.	Fulton 2	HY	WAT	400	5,656
Orion Power Holdings_ Inc.	Glenwood 1	HY	WAT	467	5,656
Orion Power Holdings_ Inc.	Glenwood 2	HY	WAT	467	5,657
Orion Power Holdings_ Inc.	Glenwood 3	HY	WAT	467	5,657
Orion Power Holdings_ Inc.	Granby 1	HY	WAT	4,450	5,663
Orion Power Holdings_ Inc.	Granby 2	HY	WAT	4,450	5,668
Orion Power Holdings_ Inc.	Green Island 1	HY	WAT	1,175	5,669
Orion Power Holdings_ Inc.	Green Island 2	HY	WAT	1,175	5,670
Orion Power Holdings_ Inc.	Green Island 3	HY	WAT	1,175	5,672
Orion Power Holdings_ Inc.	Green Island 4	HY	WAT	1,175	5,673
Orion Power Holdings_ Inc.	Hannawa 1	HY	WAT	3,515	5,677
Orion Power Holdings_ Inc.	Hannawa 2	HY	WAT	3,515	5,680
Orion Power Holdings_ Inc.	Herrings 1	HY	WAT	1,567	5,682
Orion Power Holdings_ Inc.	Herrings 2	HY	WAT	1,567	5,684
Orion Power Holdings_ Inc.	Herrings 3	HY	WAT	1,567	5,685
Orion Power Holdings_ Inc.	Heuvelton 1	HY	WAT	400	5,686
Orion Power Holdings_ Inc.	Heuvelton 2	HY	WAT	400	5,686
Orion Power Holdings_ Inc.	High Dam 1	HY	WAT	2,000	5,688
Orion Power Holdings_ Inc.	High Dam 2	HY	WAT	2,000	5,690
Orion Power Holdings_ Inc.	High Dam 3	HY	WAT	2,000	5,692
Orion Power Holdings_ Inc.	High Dam 4	HY	WAT	2,000	5,694
Orion Power Holdings_ Inc.	High Falls 1	HY	WAT	1,833	5,696
Orion Power Holdings_ Inc.	High Falls 2	HY	WAT	1,833	5,698
Orion Power Holdings_ Inc.	High Falls 3	HY	WAT	1,833	5,700
Orion Power Holdings_ Inc.	Higley 1	HY	WAT	1,667	5,702
Orion Power Holdings_ Inc.	Higley 2	HY	WAT	1,667	5,703

**Exhibit 5-2 NYISO Unit Data (Continued)**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Orion Power Holdings_ Inc.	Higley 3	HY	WAT	1,667	5,705
Orion Power Holdings_ Inc.	Hogansburg	HY	WAT	400	5,706
Orion Power Holdings_ Inc.	Hydraulic Race	HY	WAT	2,400	5,708
Orion Power Holdings_ Inc.	Inghams 1	HY	WAT	3,000	5,711
Orion Power Holdings_ Inc.	Inghams 2	HY	WAT	3,000	5,715
Orion Power Holdings_ Inc.	Johnsonville 1	HY	WAT	700	5,717
Orion Power Holdings_ Inc.	Johnsonville 2	HY	WAT	700	5,720
Orion Power Holdings_ Inc.	Kamargo 1	HY	WAT	1,167	5,721
Orion Power Holdings_ Inc.	Kamargo 2	HY	WAT	1,167	5,723
Orion Power Holdings_ Inc.	Kamargo 3	HY	WAT	1,167	5,725
Orion Power Holdings_ Inc.	Lighthouse Hill 1	HY	WAT	1,800	5,728
Orion Power Holdings_ Inc.	Lighthouse Hill 2	HY	WAT	1,800	5,732
Orion Power Holdings_ Inc.	Macomb	HY	WAT	900	5,733
Orion Power Holdings_ Inc.	Minetto 1	HY	WAT	1,470	5,735
Orion Power Holdings_ Inc.	Minetto 2	HY	WAT	1,470	5,736
Orion Power Holdings_ Inc.	Minetto 3	HY	WAT	1,470	5,738
Orion Power Holdings_ Inc.	Minetto 4	HY	WAT	1,470	5,739
Orion Power Holdings_ Inc.	Minetto 5	HY	WAT	1,470	5,740
Orion Power Holdings_ Inc.	Moshier 1	HY	WAT	3,950	5,744
Orion Power Holdings_ Inc.	Moshier 2	HY	WAT	3,950	5,748
Orion Power Holdings_ Inc.	Norfolk	HY	WAT	4,400	5,753
Orion Power Holdings_ Inc.	Norwood	HY	WAT	2,200	5,755
Orion Power Holdings_ Inc.	Oak Orchard	HY	WAT	300	5,755
Orion Power Holdings_ Inc.	Oswego Falls E 1	HY	WAT	1,833	5,757
Orion Power Holdings_ Inc.	Oswego Falls E 2	HY	WAT	1,833	5,759
Orion Power Holdings_ Inc.	Oswego Falls E 3	HY	WAT	1,833	5,761
Orion Power Holdings_ Inc.	Oswego Falls W 3	HY	WAT	390	5,761
Orion Power Holdings_ Inc.	Oswego Falls W 4	HY	WAT	905	5,762
Orion Power Holdings_ Inc.	Oswego Falls W 5	HY	WAT	905	5,763
Orion Power Holdings_ Inc.	Parishville	HY	WAT	2,500	5,766
Orion Power Holdings_ Inc.	Piercefield 1	HY	WAT	867	5,767
Orion Power Holdings_ Inc.	Piercefield 2	HY	WAT	867	5,768
Orion Power Holdings_ Inc.	Piercefield 3	HY	WAT	867	5,769
Orion Power Holdings_ Inc.	Prospect	HY	WAT	19,100	5,788
Orion Power Holdings_ Inc.	Rainbow Falls	HY	WAT	22,980	5,813
Orion Power Holdings_ Inc.	Raymondville	HY	WAT	2,000	5,815
Orion Power Holdings_ Inc.	Schaghticoke 1	HY	WAT	0	5,818
Orion Power Holdings_ Inc.	Schaghticoke 2	HY	WAT	0	5,822
Orion Power Holdings_ Inc.	Schaghticoke 3	HY	WAT	0	5,825
Orion Power Holdings_ Inc.	Schaghticoke 4	HY	WAT	0	5,829
Orion Power Holdings_ Inc.	School Street 1	HY	WAT	6,836	5,836
Orion Power Holdings_ Inc.	School Street 2	HY	WAT	6,836	5,843
Orion Power Holdings_ Inc.	School Street 3	HY	WAT	6,836	5,851
Orion Power Holdings_ Inc.	School Street 4	HY	WAT	6,836	5,858
Orion Power Holdings_ Inc.	School Street 5	HY	WAT	6,836	5,865
Orion Power Holdings_ Inc.	Schuylerville	HY	WAT	1,400	5,872
Orion Power Holdings_ Inc.	Sewalls 1	HY	WAT	1,100	5,873
Orion Power Holdings_ Inc.	Sewalls 2	HY	WAT	1,100	5,874
Orion Power Holdings_ Inc.	Sherman Island 1	HY	WAT	4,846	5,879
Orion Power Holdings_ Inc.	Sherman Island 2	HY	WAT	4,846	5,885
Orion Power Holdings_ Inc.	Sherman Island 3	HY	WAT	4,846	5,890
Orion Power Holdings_ Inc.	Sherman Island 4	HY	WAT	4,846	5,896
Orion Power Holdings_ Inc.	Sherman Island 5	HY	WAT	4,846	5,901
Orion Power Holdings_ Inc.	Soft Maple 1	HY	WAT	4,200	5,909
Orion Power Holdings_ Inc.	Soft Maple 2	HY	WAT	4,200	5,916
Orion Power Holdings_ Inc.	South Colton	HY	WAT	18,880	5,937
Orion Power Holdings_ Inc.	South Edwards 1	HY	WAT	775	5,942
Orion Power Holdings_ Inc.	South Edwards 2	HY	WAT	775	5,947
Orion Power Holdings_ Inc.	South Edwards 3	HY	WAT	775	5,952
Orion Power Holdings_ Inc.	South Edwards 4	HY	WAT	775	5,957
Orion Power Holdings_ Inc.	South Glens Falls	HY	WAT	10,000	5,967
Orion Power Holdings_ Inc.	Spier Falls 1	HY	WAT	19,115	5,988
Orion Power Holdings_ Inc.	Spier Falls 2	HY	WAT	19,115	6,009

**Exhibit 5-2 NYISO Unit Data (Continued)**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Orion Power Holdings_ Inc.	Stark	HY	WAT	25,500	6,035
Orion Power Holdings_ Inc.	Stewarts Bridge	HY	WAT	35,030	6,088
Orion Power Holdings_ Inc.	Sugar Island 1	HY	WAT	0	6,090
Orion Power Holdings_ Inc.	Sugar Island 2	HY	WAT	2,100	6,092
Orion Power Holdings_ Inc.	Sugar Island 3	HY	WAT	2,100	6,094
Orion Power Holdings_ Inc.	Talcville 1	HY	WAT	300	6,096
Orion Power Holdings_ Inc.	Talcville 2	HY	WAT	300	6,098
Orion Power Holdings_ Inc.	Taylorville 1	HY	WAT	1,125	6,100
Orion Power Holdings_ Inc.	Taylorville 2	HY	WAT	1,125	6,101
Orion Power Holdings_ Inc.	Taylorville 3	HY	WAT	1,125	6,102
Orion Power Holdings_ Inc.	Taylorville 4	HY	WAT	1,125	6,103
Orion Power Holdings_ Inc.	Trenton Falls 1	HY	WAT	9,488	6,112
Orion Power Holdings_ Inc.	Trenton Falls 2	HY	WAT	8,206	6,121
Orion Power Holdings_ Inc.	Trenton Falls 3	HY	WAT	8,206	6,129
Orion Power Holdings_ Inc.	Varick 1	HY	WAT	1,400	6,130
Orion Power Holdings_ Inc.	Varick 2	HY	WAT	1,400	6,132
Orion Power Holdings_ Inc.	Varick 3	HY	WAT	0	6,134
Orion Power Holdings_ Inc.	Varick 4	HY	WAT	1,400	6,135
Orion Power Holdings_ Inc.	Varick 5	HY	WAT	1,400	6,137
Orion Power Holdings_ Inc.	Waterport 1	HY	WAT	1,000	6,138
Orion Power Holdings_ Inc.	Waterport 2	HY	WAT	1,000	6,139
Orion Power Holdings_ Inc.	Yaleville 1	HY	WAT	300	6,139
Orion Power Holdings_ Inc.	Yaleville 2	HY	WAT	300	6,139
Rochester Gas and Electric Corp.	Mills Mills	HY	WAT	220	6,140
Rochester Gas and Electric Corp.	Mt Morris	HY	WAT	340	6,140
Rochester Gas and Electric Corp.	Station 2 1	HY	WAT	6,000	6,146
Rochester Gas and Electric Corp.	Station 26 1	HY	WAT	2,000	6,148
Rochester Gas and Electric Corp.	Station 5 1	HY	WAT	11,000	6,162
Rochester Gas and Electric Corp.	Station 5 2	HY	WAT	11,000	6,174
Rochester Gas and Electric Corp.	Station 5 3	HY	WAT	17,000	6,191
Rochester Gas and Electric Corp.	Wiscoy 1	HY	WAT	600	6,191
Rochester Gas and Electric Corp.	Wiscoy 2	HY	WAT	480	6,192
Southern Energy Inc.	Grahamsville	HY	WAT	17,000	6,209
Southern Energy Inc.	Mongaup 1	HY	WAT	800	6,210
Southern Energy Inc.	Mongaup 2	HY	WAT	1,000	6,211
Southern Energy Inc.	Mongaup 3	HY	WAT	1,000	6,212
Southern Energy Inc.	Mongaup 4	HY	WAT	1,000	6,213
Southern Energy Inc.	Rio	HY	WAT	10,200	6,223
Southern Energy Inc.	Swinging Bridge	HY	WAT	12,900	6,236
New York Power Authority	Fitzpatrick 1	NB	UR	820,000	7,066
Consolidated Edison Co. of NY	Indian Pt 2	NP	UR	941,000	8,017
New York Power Authority	Indian Pt 3	NP	UR	970,000	9,007
Rochester Gas and Electric Corp.	Ginna 1	NP	UR	498,400	9,506
KeySpan - Ravenswood_ Inc.	Ravenswood 3	ST	BIT	955,200	10,478
AES Corp.	Kintigh	ST	BIT	691,800	11,171
Central Hudson Gas & Elec. Corp.	Danskammer 4	ST	BIT	228,180	11,403
NRG Power_ Inc.	Huntley 67	ST	BIT	203,250	11,608
NRG Power_ Inc.	Dunkirk 3	ST	BIT	196,500	11,812
NRG Power_ Inc.	Dunkirk 4	ST	BIT	191,920	12,012
Southern Energy Inc.	Lovett 5	ST	BIT	197,300	12,211
NRG Power_ Inc.	Huntley 68	ST	BIT	191,250	12,405
Southern Energy Inc.	Lovett 4	ST	BIT	180,300	12,585
AES Corp.	Milliken 1	ST	BIT	153,000	12,742
AES Corp.	Milliken 2	ST	BIT	156,000	12,899
Central Hudson Gas & Elec. Corp.	Danskammer 3	ST	BIT	130,180	13,031
AES Corp.	Greenidge 4	ST	BIT	105,300	13,139
NRG Power_ Inc.	Dunkirk 1	ST	BIT	95,750	13,239
NRG Power_ Inc.	Dunkirk 2	ST	BIT	99,500	13,339
NRG Power_ Inc.	Huntley 63	ST	BIT	93,000	13,435
NRG Power_ Inc.	Huntley 66	ST	BIT	93,000	13,530
NRG Power_ Inc.	Huntley 65	ST	BIT	93,300	13,623
NRG Power_ Inc.	Huntley 64	ST	BIT	91,300	13,715
AES Corp.	Goudey 8	ST	BIT	83,500	13,799



**Exhibit 5-2 NYISO Unit Data (Continued)**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Rochester Gas and Electric Corp.	Russell 4	ST	BIT	78,000	13,879
Sempra Energy Trading Corp.	Fibertek Energy	ST	COL	77,000	13,956
Niagara Mohawk Power Corp.	Nine Mile Pt 1	NB	UR	618,200	14,578
Niagara Mohawk Power Corp.	Nine Mile Pt 2	NB	UR	1,149,800	15,742
Southern Energy Inc.	Lovett 3	ST	BIT	69,300	15,812
Rochester Gas and Electric Corp.	Russell 2	ST	BIT	64,000	15,877
Rochester Gas and Electric Corp.	Russell 3	ST	BIT	64,000	15,942
Central Hudson Enterprises Corp.	CHR-Niagara	ST	COL	56,900	15,998
AES Corp.	Greenidge 3	ST	BIT	56,000	16,054
Niagara Mohawk Energy Marketing_ Inc.	Fort Drum	ST	COL	52,800	16,108
AES Corp.	Hickling 2	ST	BIT	47,100	16,158
Rochester Gas and Electric Corp.	Russell 1	ST	BIT	46,000	16,205
AES Corp.	Goudey 7	ST	BIT	44,300	16,250
AES Corp.	Jennison 2	ST	BIT	37,500	16,288
AES Corp.	Hickling 1	ST	BIT	34,600	16,324
AES Corp.	Jennison 1	ST	BIT	35,400	16,360
Consolidated Edison of NY_ Inc.	Bkln Navy Yard	CC	NG	272,000	16,650
Sithe Energies Inc.	Sithe-Ind GT 1	GT	NG	170,000	16,820
Sithe Energies Inc.	Sithe-Ind GT 2	GT	NG	170,000	16,990
Sithe Energies Inc.	Sithe-Ind GT 3	CT	NG	170,000	17,160
Sithe Energies Inc.	Sithe-Ind GT 4	CT	NG	170,000	17,330
Constellation Power Source	Carr St.-E. Syr	CC	NG	100,300	17,433
Selkirk Cogen Partners_ L.P.	Selkirk-I	CC	NG	90,000	17,534
New York Power Authority	Flynn	CC	NG	136,364	17,701
Long Island Power Authority	Wading River 2	GT	FO2	82,000	17,804
Long Island Power Authority	Wading River 3	GT	FO2	81,000	17,907
Long Island Power Authority	Wading River 1	GT	FO2	82,000	18,009
NRG Power_ Inc.	Arthur Kill 3	ST	NG	496,000	18,510
NRG Power_ Inc.	Arthur Kill 2	ST	NG	343,000	18,860
Orion Power Holdings_ Inc.	Astoria 3	ST	NG	356,000	19,221
KeySpan - Ravenswood_ Inc.	Ravenswood 2	ST	NG	386,000	19,619
Orion Power Holdings_ Inc.	Astoria 4	ST	NG	363,000	19,984
Central Hudson Gas & Elec. Corp.	Roseton 1	ST	NG	607,100	20,591
Southern Energy Inc.	Bowline 1	ST	NG	610,000	21,204
New York Power Authority	Poletti 1	ST	NG	825,000	22,029
KeySpan - Ravenswood_ Inc.	Ravenswood 1	ST	NG	377,300	22,419
Long Island Power Authority	Northport 4	ST	NG	393,000	22,812
Long Island Power Authority	Northport 2	ST	NG	389,000	23,201
Long Island Power Authority	Northport 1	ST	NG	383,000	23,584
Consolidated Edison Co. of NY	East River 7	ST	NG	174,000	23,759
Orion Power Holdings_ Inc.	Astoria 5	ST	NG	361,000	24,128
Central Hudson Enterprises Corp.	CHR-Syracuse	CC	NG	94,700	24,223
Southern Energy Inc.	Bowline 2	ST	NG	605,000	24,838
Central Hudson Enterprises Corp.	CHR-Beaver Falls	CC	NG	86,800	24,926
Indeck-Olean LP	Indeck-Olean	CC	NG	79,300	25,013
Sithe Energies Inc.	Sithe-Ogdenbrg	CC	NG	79,500	25,100
Sithe Energies Inc.	Sithe-Massena	CC	NG	79,500	25,184
New York State Elec. & Gas Corp.	Saranac Energy Co	CC	NG	80,400	25,264
New York State Elec. & Gas Corp.	Saranac Energy Co	CC	NG	80,400	25,345
New York State Elec. & Gas Corp.	Saranac Energy Co	CC	NG	80,400	25,425
Consolidated Edison of NY_ Inc.	Cogen Tech-Linden	GT	NG	78,000	25,503
Consolidated Edison of NY_ Inc.	Cogen Tech-Linden	GT	NG	78,000	25,581
Consolidated Edison of NY_ Inc.	Cogen Tech-Linden	GT	NG	78,000	25,659
Consolidated Edison of NY_ Inc.	Cogen Tech-Linden	GT	NG	78,000	25,737
Consolidated Edison of NY_ Inc.	Cogen Tech-Linden	GT	NG	78,000	25,815
Niagara Mohawk Power Corp.	Northern Cons Pwr	CC	NG	79,800	25,895
Niagara Mohawk Power Corp.	Project Orange	CC	NG	79,500	25,975
Niagara Mohawk Power Corp.	GPUI-Onondaga Cog	CC	NG	28,000	26,055
TransCanada Power Marketing_ Ltd.	Fort Orange	CC	NG	63,750	26,125
NYSEG Solutions_ Inc.	Carthage Paper	CC	NG	60,000	26,192
NFR Power_ Inc.	American Brass	CC	NG	63,000	26,255
NYSEG Solutions_ Inc.	NSINS-S Glens Falls	CC	NG	58,000	26,318
Sithe Energies Inc.	Sithe-Sterling	CC	NG	57,000	26,380

## Exhibit 5-2 NYISO Unit Data (Continued)

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Indeck-Yerkes LP	Indeck-Yerkes	CC	NG	62,250	26,443
Sithe Energies Inc.	Sithe-Batavia	CC	NG	57,500	26,505
Indeck-Illion LP	Indeck-Illion	CC	NG	56,000	26,567
Niagara Mohawk Power Corp.	Oxbow Pwr- N.Tonaw	CC	NG	55,750	26,628
Sithe Energies Inc.	Sithe-Ind ST 1	ST	NG	200,000	26,828
Sithe Energies Inc.	Sithe-Ind ST 2	ST	NG	200,000	27,028
Long Island Power Authority	Barrett 2	ST	NG	196,000	27,224
Long Island Power Authority	Port Jefferson 4	ST	NG	195,000	27,419
Long Island Power Authority	Barrett 1	ST	NG	192,000	27,613
Long Island Power Authority	Trigen-NDEC	CC	NG	49,789	27,670
Indeck-Oswego LP	Indeck-Oswego	CC	NG	51,750	27,727
Long Island Power Authority	Barrett 11	GT	NG	39,000	27,779
Long Island Power Authority	Barrett 10	GT	NG	41,000	27,830
Long Island Power Authority	Barrett 9	GT	NG	41,000	27,881
Long Island Power Authority	TBG-Grumman	CC	NG	36,795	27,932
Long Island Power Authority	Barrett 12	GT	NG	43,000	27,980
Niagara Mohawk Power Corp.	Fulton Cogn Assoc	CC	NG	42,300	28,029
Indeck-Corinth LP	Indeck-Corinth	CC	NG	48,000	28,077
Southern Energy Inc.	Shoemaker GT	GT	NG	39,800	28,122
New York State Elec. & Gas Corp.	Lockport Cogen Pr	GT	NG	40,700	28,165
New York State Elec. & Gas Corp.	Lockport Cogen Pr	GT	NG	40,700	28,208
New York State Elec. & Gas Corp.	Lockport Cogen Pr	GT	NG	40,700	28,251
New York State Electric & Gas Corp.	Indeck-Silver Spr	CC	NG	40,100	28,294
New York Power Authority	KIAC (JFK)	CT	NG	36,000	28,334
New York Power Authority	KIAC (JFK)	CT	NG	36,000	28,374
Niagara Mohawk Power Corp.	Renns.Cogen_ BASF	GT	NG	39,625	28,414
Rochester Gas and Electric Corp.	Allegany GT	CT	NG	38,000	28,454
Long Island Power Authority	Glenwood 4	ST	NG	113,000	28,567
Long Island Power Authority	Glenwood 5	ST	NG	113,000	28,680
Long Island Power Authority	Far Rockaway 4	ST	NG	108,000	28,789
NRG Power_ Inc.	Oswego 6	ST	FO6	782,500	29,611
NRG Power_ Inc.	Oswego 5	ST	FO6	782,000	30,417
Niagara Mohawk Power Corp.	Albany 3	ST	NG	89,700	30,515
Niagara Mohawk Power Corp.	Albany 1	ST	NG	92,000	30,612
Niagara Mohawk Power Corp.	Albany 4	ST	NG	88,700	30,707
Niagara Mohawk Power Corp.	Albany 2	ST	NG	90,700	30,798
Central Hudson Gas & Elec. Corp.	Coxsackie GT	GT	NG	19,620	30,821
Consolidated Edison of NY_ Inc.	Cogen Tech-Linden	ST	NG	85,000	30,906
Consolidated Edison of NY_ Inc.	Cogen Tech-Linden	ST	NG	85,000	30,991
Consolidated Edison of NY_ Inc.	Cogen Tech-Linden	ST	NG	85,000	31,076
Rochester Gas and Electric Corp.	Allegany ST	CW	NG	21,000	31,098
Long Island Power Authority	Barrett 2	GT	NG	16,000	31,119
Orange and Rockland Utilities	Lederle	CC	NG	17,900	31,141
Central Hudson Gas & Elec. Corp.	Roseton 2	ST	FO6	607,700	31,748
Long Island Power Authority	Barrett 1	GT	NG	16,000	31,768
Long Island Power Authority	Barrett 3	GT	NG	16,000	31,788
Long Island Power Authority	Barrett 6	GT	NG	16,000	31,808
Long Island Power Authority	Barrett 7	GT	NG	14,000	31,828
Long Island Power Authority	Barrett 8	GT	NG	16,000	31,848
Long Island Power Authority	Barrett 4	GT	NG	14,000	31,867
Long Island Power Authority	Barrett 5	GT	NG	16,000	31,886
New York State Elec. & Gas Corp.	Lockport Cogen Pr	ST	NG	65,700	31,956
Consolidated Edison Co. of NY	Waterside 6	ST	NG	69,000	32,025
Rochester Gas and Electric Corp.	Station 9	GT	NG	14,000	32,043
Central Hudson Gas & Elec. Corp.	Danskammer 2	ST	NG	66,250	32,110
Central Hudson Gas & Elec. Corp.	Danskammer 1	ST	NG	63,050	32,176
New York State Electric & Gas Corp.	Indeck-Silver Spr	CC	NG	16,400	32,193
Consolidated Edison Co. of NY	East River 6	ST	NG	131,000	32,327
Consolidated Edison of NY_ Inc.	Mass Power	CC	NG	4,000	32,341
Long Island Power Authority	SUNY Stony Brook	CC	NG	14,000	32,355
Long Island Power Authority	Northport 3	ST	FO6	381,000	32,736
Consolidated Edison Co. of NY	Waterside 9	ST	NG	48,000	32,784
Consolidated Edison Co. of NY	Waterside 8	ST	NG	47,000	32,831



## Exhibit 5-2 NYISO Unit Data (Continued)

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Niagara Mohawk Power Corp.	Renns.Cogen_ BASF	ST	NG	39,625	32,871
Long Island Power Authority	Glenwood 2	GT	FO2	51,000	32,940
Long Island Power Authority	Glenwood 3	GT	FO2	52,000	33,009
Long Island Power Authority	Holtsville 10	GT	FO2	53,000	33,078
Long Island Power Authority	Holtsville 4	GT	FO2	51,000	33,147
Long Island Power Authority	Holtsville 8	GT	FO2	53,000	33,216
Long Island Power Authority	Holtsville 3	GT	FO2	51,000	33,283
Long Island Power Authority	Holtsville 6	GT	FO2	51,000	33,350
Long Island Power Authority	Holtsville 9	GT	FO2	51,000	33,417
Long Island Power Authority	Holtsville 5	GT	FO2	51,000	33,483
Long Island Power Authority	Holtsville 7	GT	FO2	49,000	33,549
Long Island Power Authority	Holtsville 1	GT	FO2	48,000	33,613
Long Island Power Authority	West Babylon 4	GT	FO2	47,000	33,676
Long Island Power Authority	Holtsville 2	GT	FO2	48,000	33,737
Long Island Power Authority	Shoreham 1	GT	FO2	48,000	33,798
Long Island Power Authority	Port Jefferson 3	ST	FO6	192,000	33,991
Niagara Mohawk Power Corp.	General Mills Inc	CC	NG	3,300	33,996
New York Power Authority	KIAC (JFK)	ST	NG	18,000	34,016
Niagara Mohawk Power Corp.	Burrws-Little Falls 1	CC	NG	0	34,021
Niagara Mohawk Power Corp.	Burrws-Little Falls 2	CC	NG		34,025
NRG Power_ Inc.	Astoria GT 2-1	GT	NG	39,200	34,068
NRG Power_ Inc.	Astoria GT 2-2	GT	NG	40,200	34,114
NRG Power_ Inc.	Astoria GT 2-3	GT	NG	40,300	34,160
NRG Power_ Inc.	Astoria GT 2-4	GT	NG	40,500	34,205
NRG Power_ Inc.	Astoria GT 3-1	GT	NG	40,200	34,248
NRG Power_ Inc.	Astoria GT 3-2	GT	NG	40,900	34,294
NRG Power_ Inc.	Astoria GT 3-3	GT	NG	42,000	34,340
NRG Power_ Inc.	Astoria GT 3-4	GT	NG	40,700	34,386
NRG Power_ Inc.	Astoria GT 4-1	GT	NG	40,000	34,430
NRG Power_ Inc.	Astoria GT 4-2	GT	NG	38,900	34,474
NRG Power_ Inc.	Astoria GT 4-3	GT	NG	40,200	34,518
NRG Power_ Inc.	Astoria GT 4-4	GT	NG	40,200	34,558
Consolidated Edison Co. of NY	Indian Pt GT 2	GT	FO2	19,700	34,585
Long Island Power Authority	East Hampton 1	GT	FO2	22,000	34,610
Niagara Mohawk Power Corp.	Ellicottville Energy	GT	NG	2,800	34,613
KeySpan - Ravenswood_ Inc.	Ravenswood 10	GT	NG	19,830	34,637
KeySpan - Ravenswood_ Inc.	Ravenswood 11	GT	NG	19,840	34,662
KeySpan - Ravenswood_ Inc.	Ravenswood 8	GT	NG	19,790	34,686
KeySpan - Ravenswood_ Inc.	Ravenswood 9	GT	NG	19,790	34,709
Long Island Power Authority	Shoreham 2	GT	FO2	17,000	34,732
Niagara Mohawk Power Corp.	Syracuse Power Co.	CC	NG	0	34,735
Central Hudson Gas & Elec. Corp.	South Cairo	GT	KER	18,620	34,757
Long Island Power Authority	Glenwood 1	GT	FO2	13,000	34,777
Long Island Power Authority	P Jefferson GT	GT	FO2	16,000	34,797
Long Island Power Authority	Northport GT	GT	FO2	15,000	34,816
Rochester Gas and Electric Corp.	Beebee GT	GT	FO2	14,000	34,834
Consolidated Edison Co. of NY	Indian Pt GT 3	GT	FO2	13,400	34,852
Long Island Power Authority	Southold 1	GT	FO2	13,000	34,868
Long Island Power Authority	S Hampton 1	GT	FO2	9,000	34,882
Consolidated Edison Co. of NY	59 St. GT 1	GT	KER	17,000	34,899
Consolidated Edison of NY_ Inc.	York-Warbasse	CG	NG	4,000	34,903
Consolidated Edison of NY_ Inc.	York-Warbasse	CG	NG	17,000	34,920
Indeck-Corinth LP	Indeck-Corinth	CG	NG	80,000	35,000
Selkirk Cogen Partners_ L.P.	Selkirk-II	CG	NG	79,000	35,079
Selkirk Cogen Partners_ L.P.	Selkirk-II	CG	NG	79,000	35,158
Selkirk Cogen Partners_ L.P.	Selkirk-II	CG	NG	107,000	35,265
Long Island Power Authority	Port Jefferson 1	ST	FO6	0	35,309
Long Island Power Authority	Port Jefferson 2	ST	FO6	0	35,353
KeySpan - Ravenswood_ Inc.	Ravenswood 2-2	GT	NG	35,940	35,395
KeySpan - Ravenswood_ Inc.	Ravenswood 2-3	GT	NG	33,940	35,441
KeySpan - Ravenswood_ Inc.	Ravenswood 2-4	GT	NG	35,940	35,487
KeySpan - Ravenswood_ Inc.	Ravenswood 3-1	GT	NG	36,440	35,531
KeySpan - Ravenswood_ Inc.	Ravenswood 3-2	GT	NG	33,640	35,575

**Exhibit 5-2 NYISO Unit Data (Continued)**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
KeySpan - Ravenswood_ Inc.	Ravenswood 2-1	GT	NG	33,940	35,618
KeySpan - Ravenswood_ Inc.	Ravenswood 3-3	GT	NG	35,940	35,662
KeySpan - Ravenswood_ Inc.	Ravenswood 3-4	GT	NG	34,000	35,703
Orion Power Holdings_ Inc.	Narrows 1-1	GT	NG	18,800	35,728
Orion Power Holdings_ Inc.	Narrows 1-2	GT	NG	19,600	35,754
Orion Power Holdings_ Inc.	Narrows 1-3	GT	NG	16,300	35,780
Orion Power Holdings_ Inc.	Narrows 1-4	GT	NG	19,000	35,806
Orion Power Holdings_ Inc.	Narrows 1-5	GT	NG	15,600	35,829
Orion Power Holdings_ Inc.	Narrows 1-6	GT	NG	18,100	35,855
Orion Power Holdings_ Inc.	Narrows 1-7	GT	NG	16,500	35,879
Orion Power Holdings_ Inc.	Narrows 1-8	GT	NG	16,500	35,901
Orion Power Holdings_ Inc.	Narrows 2-1	GT	NG	17,700	35,926
Orion Power Holdings_ Inc.	Narrows 2-2	GT	NG	16,700	35,949
Orion Power Holdings_ Inc.	Narrows 2-3	GT	NG	18,100	35,974
Orion Power Holdings_ Inc.	Narrows 2-4	GT	NG	17,000	35,991
Orion Power Holdings_ Inc.	Narrows 2-5	GT	NG	15,500	36,013
Orion Power Holdings_ Inc.	Narrows 2-6	GT	NG	17,700	36,035
Orion Power Holdings_ Inc.	Narrows 2-7	GT	NG	16,400	36,056
Orion Power Holdings_ Inc.	Narrows 2-8	GT	NG	17,900	36,077
Long Island Power Authority	South Oaks Hosp	IC	NG	240	36,077
New York Power Authority	Bronx Zoo	IC	NG	2,000	36,079
Niagara Mohawk Power Corp.	Cal Ban Power	IC	NG	50	36,080
Niagara Mohawk Power Corp.	Hydrocarbon-Algny	IC	NG	1,620	36,081
Orange and Rockland Utilities	Intl. Crossroads	IC	NG	3,000	36,084
Southern Energy Inc.	Hillburn GT	GT	NG	36,100	36,131
NRG Power_ Inc.	Astoria GT 05	GT	FO2	13,600	36,148
NRG Power_ Inc.	Astoria GT 07	GT	FO2	14,100	36,164
NRG Power_ Inc.	Astoria GT 09	GT	FO2	13,600	36,182
NRG Power_ Inc.	Astoria GT 10	GT	FO2	19,900	36,211
NRG Power_ Inc.	Astoria GT 11	GT	FO2	21,300	36,239
NRG Power_ Inc.	Astoria GT 12	GT	FO2	21,800	36,267
NRG Power_ Inc.	Astoria GT 13	GT	FO2	21,100	36,295
KeySpan - Ravenswood_ Inc.	Ravenswood 6	GT	NG	16,900	36,313
KeySpan - Ravenswood_ Inc.	Ravenswood 7	GT	NG	15,820	36,332
KeySpan - Ravenswood_ Inc.	Ravenswood 4	GT	NG	15,400	36,350
KeySpan - Ravenswood_ Inc.	Ravenswood 5	GT	NG	14,900	36,366
KeySpan - Ravenswood_ Inc.	Ravenswood 1	GT	NG	9,000	36,377
Orion Power Holdings_ Inc.	Astoria GT 01	GT	NG	11,200	36,388
Niagara Mohawk Power Corp.	Nottingham High S	CC	NG	100	36,388
Niagara Mohawk Power Corp.	Ellicottville Energy	ST	NG	500	36,389
Orion Power Holdings_ Inc.	Gowanus 1-1	GT	FO2	16,300	36,414
Orion Power Holdings_ Inc.	Gowanus 1-2	GT	FO2	17,000	36,436
Orion Power Holdings_ Inc.	Gowanus 1-3	GT	FO2	16,400	36,459
Orion Power Holdings_ Inc.	Gowanus 1-4	GT	FO2	16,300	36,482
Orion Power Holdings_ Inc.	Gowanus 1-5	GT	FO2	15,400	36,505
Orion Power Holdings_ Inc.	Gowanus 1-6	GT	FO2	16,500	36,526
Orion Power Holdings_ Inc.	Gowanus 1-7	GT	FO2	2,000	36,528
Orion Power Holdings_ Inc.	Gowanus 1-8	GT	FO2	2,000	36,530
Orion Power Holdings_ Inc.	Gowanus 2-1	GT	FO2	15,400	36,551
Orion Power Holdings_ Inc.	Gowanus 2-2	GT	FO2	16,500	36,573
Orion Power Holdings_ Inc.	Gowanus 2-3	GT	FO2	13,900	36,593
Orion Power Holdings_ Inc.	Gowanus 2-4	GT	FO2	15,700	36,616
Orion Power Holdings_ Inc.	Gowanus 2-5	GT	FO2	14,000	36,636
Orion Power Holdings_ Inc.	Gowanus 2-6	GT	FO2	15,600	36,657
Orion Power Holdings_ Inc.	Gowanus 2-7	GT	FO2	16,200	36,678
Orion Power Holdings_ Inc.	Gowanus 2-8	GT	FO2	15,500	36,699
Orion Power Holdings_ Inc.	Gowanus 3-1	GT	FO2	14,100	36,722
Orion Power Holdings_ Inc.	Gowanus 3-2	GT	FO2	14,200	36,745
Orion Power Holdings_ Inc.	Gowanus 3-3	GT	FO2	15,300	36,767
Orion Power Holdings_ Inc.	Gowanus 3-4	GT	FO2	14,800	36,788
Orion Power Holdings_ Inc.	Gowanus 3-5	GT	FO2	15,600	36,810
Orion Power Holdings_ Inc.	Gowanus 3-6	GT	FO2	16,400	36,831
Orion Power Holdings_ Inc.	Gowanus 3-7	GT	FO2	15,500	36,853

**Exhibit 5-2 NYISO Unit Data (Continued)**

Utility	Plant Name	Unit Type	Fuel	Summer Rating	Cumulative MW
Orion Power Holdings_ Inc.	Gowanus 3-8	GT	FO2	15,400	36,874
Orion Power Holdings_ Inc.	Gowanus 4-1	GT	FO2	15,100	36,895
Orion Power Holdings_ Inc.	Gowanus 4-2	GT	FO2	17,100	36,917
Orion Power Holdings_ Inc.	Gowanus 4-3	GT	FO2	15,900	36,939
Orion Power Holdings_ Inc.	Gowanus 4-4	GT	FO2	15,900	36,959
Orion Power Holdings_ Inc.	Gowanus 4-5	GT	FO2	14,800	36,983
Orion Power Holdings_ Inc.	Gowanus 4-6	GT	FO2	15,600	37,005
Orion Power Holdings_ Inc.	Gowanus 4-7	GT	FO2	16,300	37,028
Orion Power Holdings_ Inc.	Gowanus 4-8	GT	FO2	16,300	37,049
AES Corp.	Milliken IC 1	IC	FO2	2,750	37,052
AES Corp.	Milliken IC 2	IC	FO2	2,750	37,055
Central Hudson Gas & Elec. Corp.	Danskammer 5	IC	FO2	2,540	37,057
Central Hudson Gas & Elec. Corp.	Danskammer 6	IC	FO2	2,540	37,060
Long Island Power Authority	East Hampton 2	IC	FO2	2,000	37,062
Long Island Power Authority	East Hampton 3	IC	FO2	2,000	37,064
Long Island Power Authority	East Hampton 4	IC	FO2	2,000	37,066
Long Island Power Authority	Montauk 2	IC	FO2	2,000	37,068
Long Island Power Authority	Montauk 3	IC	FO2	2,000	37,070
Long Island Power Authority	Montauk 4	IC	FO2	2,000	37,072
New York State Elec. & Gas Corp.	Harris Lake	IC	FO2	1,800	37,074
Niagara Mohawk Power Corp.	Albany IC 1	IC	FO2	700	37,074
NRG Power_ Inc.	Dunkirk IC 2	IC	FO2	500	37,075
NRG Power_ Inc.	Huntley IC 1	IC	FO2	700	37,076
NRG Power_ Inc.	Oswego IC 1	IC	FO2	700	37,076
NRG Power_ Inc.	Oswego IC 2	IC	FO2	800	37,077
NRG Power_ Inc.	Oswego IC 3	IC	FO2	800	37,078
Niagara Mohawk Power Corp.	Burrws-Little Falls 3	CC	FO2		37,078
Consolidated Edison Co. of NY	74 St. GT 1	GT	KER	13,100	37,095
Consolidated Edison Co. of NY	74 St. GT 2	GT	KER	10,500	37,106
NRG Power_ Inc.	Arthur Kill 1	GT	KER	13,800	37,122
NRG Power_ Inc.	Astoria GT 08	GT	FO2	13,600	37,138
Consolidated Edison Co. of NY	Hudson Ave 3	GT	KER	14,700	37,156
Consolidated Edison Co. of NY	Hudson Ave 4	GT	KER	14,700	37,173
Consolidated Edison Co. of NY	Hudson Ave 5	GT	KER	14,100	37,190
Consolidated Edison Co. of NY	Indian Pt GT 1	GT	FO2	13,400	37,210

## **6. Adding New Generation Capacity in NYISO**

This section discusses the NYISO approval hurdles needed by any generating company owner planning to add any interconnected generation in the region. Adding new capacity with the deregulation of the electric market, has become a marketplace function. As of July 2001, there were 101 applications before the NYISO for new power plant interconnection studies. Nineteen (19) of the projects represented more than 12,000 MW. The type of plant, its fuel supply, size, and location are determined by market conditions and the objectives of private developers. The NYISO's LBMP pricing system is sending clear pricing signal that new generation is needed in Southeastern New York to meet growth load.

### **6.1 Determination of a New Interconnection**

For the purpose of determining whether a proposed generation or transmission project is to be considered a new interconnection project that is obligated to satisfy the queuing and reliability impact study requirements of the NYISO, the following factors will apply:

- The proposed generation or transmission project shall be presumed to be a new interconnection subject to the requirements.
- The Developer can rebut this presumption if it satisfies the ISO Staff and TPAS that the proposed project is merely changes to an existing interconnection.

In the rebuttal to the ISO Staff and TPAS it must satisfy them that the following two points are true. The defining electrical characteristics of the facility when completed do not materially differ from a preexisting facility in a manner adverse to system reliability. Also the preexisting facility has not been retired at the time of the application.

If the project is deemed a new Interconnection it must abide by the requirements of Section 19B and 19C of the OATT (open access transmission tariff).

### **6.2 Feasibility Study**

The feasibility study is an analysis procedure used by NYISO to assess the practicality and costs involved to incorporate a generating unit into NYISO. The analysis is limited to load flow analysis of the more probable contingencies and short circuit studies and does not include grid stability. The study focuses on determining preliminary estimates of type, scope, cost, and lead

time for construction of facilities required to interconnect the project. Results are provided to the applicant and the affected transmission owners and are published on the NYISO web site. NYISO maintains the confidentiality of the applicant in these reports. After reviewing the results of the feasibility study, the applicant decides whether or not to pursue the system impact study. If the applicant decides to proceed, a system impact study agreement must be submitted to NYISO with a \$50,000 deposit. Proof is required of initial application for required air permits, if any, and the applicant must identify whether the project is to be connected as a capacity or energy-only resource. New generation applicants may request either of two forms of interconnection service, capacity or energy-only service. Energy-only status allows the generator to participate in energy markets based on locational prices. Capacity status is based on providing sufficient transmission capability to ensure deliverability to network load within NYISO and to satisfy various contingency criteria established by the Mid-Atlantic Area Council (MAAC). Specific tests performed during the feasibility and system impact studies identify upgrades required to satisfy these criteria.

## **6.3 System Impact Study**

The system impact study is a comprehensive analysis of the impact of adding the new generation to the Interconnection, and its deliverability to NYISO load. The study identifies the system constraints relating to the project and the attachment facilities, local upgrades, and network upgrades. The study refines and more comprehensively estimates cost responsibility and construction lead times for facilities and upgrades. Relationships are studied between the new generator, other planned new generators in the queues, and the existing Interconnection as a whole. This Study also encompasses an analysis of existing firm and non-firm transmission service requests. The results of the study will be provided to all applicants who had projects evaluated in the study project, and to affected transmission owners, and will be posted on the NYISO web site. While confidentiality obligations are honored by NYISO, the identity of the applicants at this stage is not considered confidential in these reports. The identity of all applicants, and the size and location of projects for which system impact studies have been completed are published on the NYISO web site. After reviewing the results of the study, the applicant must make a decision on whether or not to continue with the project.

## **6.4 Facilities Study**

Upon completion of the system impact study, NYISO furnishes a facilities study agreement to the applicant. The facilities study agreement provides the estimated cost responsibility and estimated completion date for the study. It may also define milestone dates that the proposed project must meet to retain its assigned priority. If the applicant decides to proceed, the executed facilities study agreement is returned to NYISO accompanied by the required deposit. The deposit at this stage will be either \$100,000 or the estimated amount of its cost responsibility for the facilities study, whichever amount is higher. Upon completion of the facilities study, NYISO

provides a good faith estimate of the cost to be charged to the applicant for attachment facilities, local upgrades and network upgrades necessary to accommodate the project, and an estimate of the time required to complete construction of the facilities and upgrades. NYISO will furnish an interconnection service agreement to be executed by the applicant. In order to proceed with an interconnection service agreement, the applicant must demonstrate within 60 days of receipt of the facilities study that it has met certain milestones. The applicant must show that it has entered fuel delivery and water agreements, if necessary, and that it controls any necessary rights-of-way for fuel and water interconnections. It must have obtained any necessary local, county, and state site permits; and signed a memorandum of understanding for the acquisition of major equipment. In addition, the regional transmission owner (RTO) may also require that a separate interconnection agreement be executed. This would be an agreement between the applicant and the RTO regarding construction of facilities and upgrades, parallel operation of the two systems, and other matters generally included in accordance with good utility practice. The agreements and studies referred to above are more fully described in Part IV of the NYISO Interconnection, LLC Open Access Transmission Tariff available from FERC or from the NYISO web site at <http://www.NYISO.com>.

Prior to the summer 2001 peak load period, NYISO expects 802 MW of capacity additions and enhancements (shown in Exhibit 6-1 below). Of these capacity additions, 717 MW are expected in the New York City load zone and 85 MW in the Long Island load zones. The New York Power Authority (NYPA) plans eleven new units totaling 452 MW of natural gas fired combustion turbines in the New York City metropolitan area. These units were announced at the end of the summer 2000 and are on a very compressed development schedule. Of the generation changes expected in the New York City load zone, 249 MW has been completed, 347 MW are “likely” and 121 MW are considered “possible” by June 1, 2001.

#### **Exhibit 6-1 Resource Additions in NYC/LI - Summer 2001**

Generator	Capacity
Orion/Astoria #2 (restart)	175
ConEdison Hudson Ave #10 (restart)	60
Linden/Cogen Tech (upratings)	40
Gowanus GT (repair)	34
NYPA CTs (various NYC locations)	408
NYPA CT (LI location)	44
NYPA Holtsville (uprating)	6
Barrett (uprating) (LI)	26
Glenwood (uprating) (LI)	9



## **6.5 Committed NYISO Capacity Additions**

NYISO has responsibility for Regional Transmission Expansion Planning and oversees the process of adding new generation resources to the NYISO system. NYISO created a model for analyzing regional electric generation needs, determined procedures for evaluating individual proposals, and defined “generation request queues” for proposed projects. Links to the current request queues as well as documentation on the procedures are shown here. The Transmission Expansion Advisory Committee meets periodically to review progress on regional expansion planning.

Generators in NYISO may:

- Sell generation directly into NYISO and receive payment at locational based marginal price (LBMP).
- Sell capacity bilaterally or through the Capacity Credits Market.
- Sell Regulation into the market-based regulation market (effective June 1, 2000) and be in a position to participate in other future Ancillary Services Markets.
- Sell energy from their unit to areas outside of NYISO.
- Self-schedule their generation to serve their load obligation.

### **6.5.1 New Generation Projects**

A company proposing a new generation project does not need to become a NYISO member until the project is close to commercial operation. Submission of an Interconnection Application and Feasibility Study Agreement is the first step in this process, after which the project will be assigned a queue position based on the date of submission. Following the feasibility study, the project may be withdrawn or continued to the impact study phase.

### **6.5.2 Interconnection Service Agreements**

New project owners need to execute an Interconnection Service Agreement with NYISO Interconnection, LLC. This agreement defines the rights and responsibilities for construction of facilities and upgrades to accommodate the project. New owners of existing generating units must also execute an Interconnection Service Agreement with NYISO. A separate Interconnection Service Agreement is needed with the local electric distribution company or transmission owner regarding construction of facilities, parallel operation of the two systems, and other matters in accordance with good utility practice.



These agreements define specifically the equipment and responsibilities of each party. The structure and detail contained in the interconnection agreements is very important to all parties involved. Some of the issues considered as the parties develop the agreements include:

- Identification of who will design and construct facilities and upgrades (including completion schedules).
- Specification of any special operating restrictions that are a condition of interconnection necessary to meet reliability criteria.
- Identification of who will own and who will maintain equipment – e.g., transformers, instantaneous metering, billing metering.
- Identify what provisions are there to assure agreement of parties for billing metering readings.
- Establish who provides routine meter calibration/verification.
- Identify if the generator is connected to a NYISO Open access tariff facility. If not, distribution services should be contracted from host utility.
- Establish who will provide the systems to interface with NYISO.
- Establish what data are to be provided to the distribution company's local control center (LCC).
- Describe what arrangements are required by the distribution company for the unit to operate for distribution reasons.
- Establish what services the seller will provide until new buyer systems are in place and ownership is transferred.
- Establish who will provide station power and light. This should be contracted unless buyer qualifies as load serving entity. NYISO is a wholesale supplier only.

### **6.5.3 New Generation**

As specified in the NYISO Open Access Transmission Tariff, Section 36, when a new generation owner approaches NYISO to connect a new project to the NYISO system, an interconnection request must be submitted along with a signed feasibility study agreement and a non-refundable deposit of \$10,000. The Request must describe the location, size, equipment configuration, in-service date, and proof of right to control the site for the proposed project. The project is then placed into a queue. Queue positions are determined by the date of submission of

the interconnection request. The applicant is obligated to pay the actual costs of studies conducted by NYISO on its behalf, and the non-refundable deposit of \$10,000 is applied to those costs as work is completed.

## **6.6 Generation Interconnection Request Queues**

In order to maintain a logical and efficient manner in which new generation is added to the system, NYISO has established a queue setup that establishes positions by network requirements and timing for new generation projects. Currently in the queue, representing over 30,000 MW of planned additions to the NYISO system. In Exhibit 6-2 below gives the projects and their sizes and location, listed in the order in which they were received and the status of their evaluation by NYISO.

Also included for review are the proposed transmission interconnections planned for the NYISO. These are shown in Exhibit 6-3.

## Exhibit 6-2 Proposed Interconnection in NYISO

Site #	Project Name	Owner/Developer	Size (MW)	Date of Study Application	S	Interconnection Point	Utility	Status of Article X	Proposed In-Service
1	Middletown Station	Con Edison	N/A	09/15/1989	C	Coop Corn- Rock Tav Lines	NYPA	N/A	2001
2	Athens Gen	Athens Gen Co./PG& E	1080	04/27/1998	C	Leeds- Pl. Val. 91 Line	NMPC	Approved 6/13/00	2002
3	Bethlehem Energy Center	PSEG Power NY	350	04/27/1998	C	Albany	NMPC	Appl filed 11/27/98	2002
4	CT- LI DC Tie-	line LIPA/Trans Energie US	330	07/20/1998	C	"C Shoreham, Long Island "	LIPA	N/A	2002
5	Torne Valley Station	Sithe Energies	860	01/28/1999	A	Ramapo	CONED	Appl filed 11/15/99	2003
6	Sunset Energy Fleet	Sunset Energy Fleet LLC	520	02/17/1999	C	C Gowanus	CONED	Appl filed 7/26/00	2002
7	Ramapo Energy	American National Power	1100	02/23/1999	C	Ramapo	CONED	Appl accepted 1/02/01	2003
8	Grassy Point	Columbia Electric Corp.	0	02/23/1999	W	West Haverstraw	CONED	Withdrawn	N/A
9	Millennium 1	Millennium Power Gen Co. LLC	160	02/23/1999	A	Hell Gate/Bruckner	CONED	(No Filing)	2003
10	Millennium 2	Millennium Power Gen Co. LLC	320	02/23/1999	A	Hell Gate/Bruckner	CONED	(No Filing)	2003
11	East Coast Power- Linden	East Coast Power- Linden Venture LP	20	03/25/1999	A	Goethals	CONED	N/A	2001
12	East Coast Power- Linden	East Coast Power- Linden Venture LP	70	03/25/1999	A	Goethals	CONED	N/A	2002
13	East Coast Power- Linden	East Coast Power- Linden Venture LP	160	03/25/1999	I	Goethals	CONED	N/A	2002
14	East Coast Power- Linden	East Coast Power- Linden Venture LP	160	03/25/1999	I	Goethals	CONED	N/A	(None)
15	CT- LI AC Tie- line	AEP Resources Service Corp.	600	04/13/1999	I	"Shoreham, Long Island"	LIPA	N/A	(None)
16	ABB Oak Point Yard	ABB Development Corp.	1075	04/15/1999	A	Hell Gate/Bruckner	CONED	Prelim filed 6/30/00	2003
17	KeySpan Ravenswood	"KeySpan Energy, Inc. "	270	04/21/1999	C	Ravenswood	CONED	Appl accepted 01/24/2001	2003
18	Poletti Expansion	NYPA	500	04/30/1999	C	Astoria	CONED	Appl accepted 4/30/01	2004
19	SEFCO	NYC Energy LLC	79.9	05/07/1999	R	Kent Ave	CONED	N/A	2002
20	Spagnoli Road CC Unit	"KeySpan Energy, Inc. "	250	05/17/1999	R	Spagnoli Road LIPA (No Filing)	LIPA	(No Filing)	2003
21	Shoreham Gen Station	"KeySpan Energy, Inc. "	250	05/17/1999	A	Shoreham LIPA (No Filing)	LIPA	(No Filing)	2003
22	Wawayanda Energy Center	Calpine Eastern Corporation	500	06/10/1999	R	Coop Corn- Rock Tav Lines	NYPA	Prelim filed 7/27/00	2003

**Exhibit 6-2 Proposed Interconnection in NYISO (Continued)**

Site #	Project Name	Owner/Developer	Size (MW)	Date of Study Application	S	Interconnection Point	Utility	Status of Article X	Proposed In-Service
23	Calpine Two Energy Center	Calpine Eastern Corporation	1080	06/25/1999	I	Coop Corn- Rock Tav Lines	NYPA	(No Filing)	2003
24	Astoria Repowering-Phase 1	Orion Power	499	07/13/1999	A	Astoria	CONED	Prelim filed 9/5/00	2003
25	East River Repowering	Consolidated Edison of NY	288	08/10/1999	C	E. 13th St.	CONED	Appl accepted 7/31/00	2002
26	Twin Tier Power	"Twin Tier Power, LLC "	520	08/20/1999	A	Watercure- Oakdale 31 Line	NYSEG	Pre- app filed 07/19/99	2003
27	Far Rockaway Barge	ENRON	0	09/08/1999	W	Far Rockaway LIPA	LIPA	N/A	N/A
28	Spagnoli Road GT Unit	"KeySpan Energy, Inc. "	79.9	09/08/1999	A	Spagnoli Road LIPA N/A	LIPA	N/A	2002
29	Bowline Point Unit 3	"Southern Energy, Inc. "	750	10/13/1999	C	W. Haverstraw	CONED	Appl accepted 8/10/00	2002
30	Heritage Station	Sithe Energies	800	10/29/1999	C	Independence (Oswego)	NMPC	Approved 1/17/01	2003
31	Astoria Energy	"SCS Energy, LLC"	1000	11/16/1999	C	Astoria	CONED	Appl accepted 3/01/01	2003
32	Brookhaven Energy	American National Power	580	11/22/1999	R	Holbrook- Brookhaven Line	LIPA	Appl filed 6/25/01	2003
33	Glenville Energy Park	"Glenville Energy Park, LLC "	810	11/30/1999	C	Rotterdam	NMPC	Prelim filed	2003
34	North First Street	York Research Corp.	500	01/11/2000	P	Con Ed System	CONED	(No Filing)	2004
35	Gotham Power - Bronx I	1st Rochdale Coop Group	79	01/12/2000	A	Parkchester/Tremont	CONED	N/A	2002
36	Project Neptune DC Phase 1	"Atlantic Energy, LLC"	1200	01/21/2000	R	"Rainey, Farragut, or W49th St"	CONED	N/A	2004
37	Kitchen	"Caithness Energy, LLC "	750	01/28/2000	P	Riverh'd- Brookh'n- Holb'k	LIPA	Prelim filed 8/17/00	2002
38	Far Rochaway Gen Ext.	"KeySpan Energy, Inc. "	79	02/01/2000	P	Far Rockaway	LIPA	N/A	2002
39	E. F. Barrett Gen Ext	"KeySpan Energy, Inc. "	79	02/01/2000	P	Barrett	LIPA	N/A	2002
40	Riverhead Gen Station	"KeySpan Energy, Inc. "	79	02/01/2000	A	Riverhead	LIPA	N/A	2002
41	Southampton Gen Ext.	"KeySpan Energy, Inc. "	79	02/01/2000	A	Southampton	LIPA	N/A	2002
42	Holbrook Energy	"PP& L Global, Inc. "	300	02/01/2000	P	Holbrook LIPA (No Filing)	LIPA	(No Filing)	2003
43	PPL Kings Park	"PP& L Global, Inc. "	300	02/01/2000	C	Pilgrim	LIPA	Prelim filed 12/20/00	2002
44	Ruland Energy	"PP& L Global, Inc. "	300	02/01/2000	P	Ruland Road	LIPA	(No Filing)	2003
45	Freeport Energy	"PP& L Global, Inc."	100	02/01/2000	P	Freeport	LIPA	(No Filing)	2003
46	Brookhaven Energy	"PP& L Global, Inc. "	300	02/03/2000	P	Brookhaven	LIPA	(No Filing)	2003
47	GenPower DC Tie- line	"GenPower, LLC "	800	02/09/2000	A	West 49th Sreet	CONED	N/A	2003
48	PPL Kings Park Ext.	"PP& L Global, Inc. "	300	02/10/2000	I	Pilgrim	LIPA	(No Filing)	2002
49	Brookhaven Energy Ext.	"PP& L Global, Inc. "	300	02/10/2000	P	Brookhaven	LIPA	(No Filing)	2003
50	AES Smithtown Gen	"AES Long Island, LLC "	510	02/10/2000	P	LIPA System	LIPA	(No Filing)	2004

**Exhibit 6-2 Proposed Interconnection in NYISO (Continued)**

Site #	Project Name	Owner/Developer	Size (MW)	Date of Study Application	S	Interconnection Point	Utility	Status of Article X	Proposed In-Service
51	Wading River Gen Ext.	"KeySpan Energy, Inc."	150	02/15/2000	P	Wading River	LIPA	(No Filing)	2002
52	Fort Drum Gen Exp.	Nia Mo Energy/Black River Power	50	03/06/2000	P	Fort Drum	NMPC	N/A	2001
53	"CT- Ruland, LI DC Tie "	"TransEnergie US, Ltd "	300	03/07/2000	P	Ruland Road	LIPA	N/A	2003
54	"CT- Pilgrim, LI DC Tie "	"TransEnergie US, Ltd "	300	03/07/2000	P	Pilgrim	LIPA	N/A	2003
55	Fenner Wind Energy Fac.	"Canastota Wind Power, LLC "	50	03/14/2000	C	Fenner- Whitman	NMPC	N/A	2001
56	Gotham Power - Brooklyn	1st Rochdale Coop Group	79	03/17/2000	P	Kent Ave	CONED	N/A	2002
57	Flat Rock Windpower	"Flat Rock Windpower, LLC"	100	03/21/2000	P	Lowville- Boonville	NMPC	(No Filing)	2001
58	Lovett #3 Repowering	"Southern Energy Lovett, LLC"	180	03/23/2000	P	Lovett	CONED	(No Filing)	2004
59	Hillburn Unit #2	"Southern Energy NY Gen, LLC "	79.9	03/23/2000	P	Hillburn	CONED	N/A	2003
60	Hillburn #2 Conversion	"Southern Energy NY Gen, LLC "	40	03/23/2000	P	Hillburn	CONED	N/A	2005
61	Greenpoint Energy Park	"GTM Energy, LLC"	0	04/19/2000	W	Rainey- Farragut Lines	CONED	(No Filing)	N/A
62	Project Orange Project	"Orange Associates, LP "	420	05/08/2000	P	Temple St.	NMPC	(No Filing)	2002
63	LSA Station A	"Lewis Staley Associates, Inc. "	650	05/11/2000	P	Homer City- Stolle Rd Line	NYSEG	(No Filing)	2002
64	LSA Station B	"Lewis Staley Associates, Inc. "	600	05/12/2000	P	Dunkirk- Gardenville Line	NMPC	(No Filing)	2002
65	Lockport II Gen Station	"Fortistar Power Marketing, LLC "	79.9	05/15/2000	A	Harrison Station	NYSEG	N/A	2001
66	Langlois Converter	TransEnergie HQ	100	06/02/2000	A	"Langlois, Quebec"	NMPC	N/A	2001
67	Walkill Energy	"Titan Development, LLC"	1080	06/21/2000	P	Coop Corn- Rock Tav Lines	NYPA	(No Filing)	2003
68	Ruland Energy Ext.	"PP& L Global, Inc. "	300	06/23/2000	P	Ruland Road	LIPA	(No Filing)	2003
69	Empire State Newsprint	Besicorp/Empire State	660	07/14/2000	A	Reynolds Road	NMPC	Prelim filed 11/22/00	2004
70	Astoria Repowering- Phase 2	Orion Power	800	08/18/2000	A	Astoria	CONED	Prelim filed 9/5/00	2005
71	Mill Creek Wind Plant	"Mill Creek Wind Plant, LLC "	50	09/08/2000	P	Lowville	NMPC	N/A	2001-02
72	Island Generating Station	"Fortistar Power Marketing, LLC "	79.9	09/08/2000	P	Fresh Kills	CONED	N/A	2002
73	Island Generating Station #2	"Fortistar Power Marketing, LLC "	500	09/08/2000	P	Fresh Kills	CONED	(No Filing)	2002
74	Oceanside Energy Center	"FPL Energy, LLC "	560	10/10/2000	P	Barrett	LIPA	(No Filing)	2004

**Exhibit 6-2 Proposed Interconnection in NYISO (Continued)**

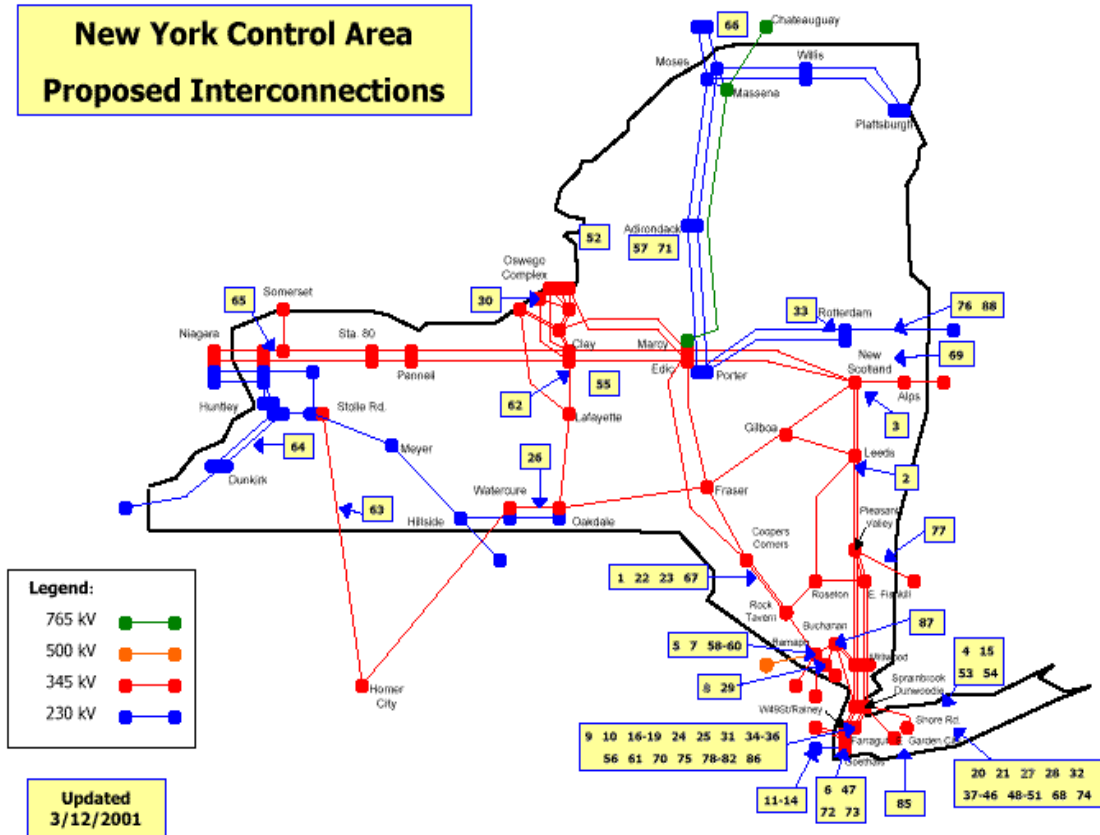
Site #	Project Name	Owner/Developer	Size (MW)	Date of Study Application	S	Interconnection Point	Utility	Status of Article X	Proposed In-Service
75	Gotham Power - Bronx II	1st Rochdale Coop Group	79	10/17/2000	P	Hell Gate/Bruckner	CONED	N/A	2002
76	Waterford	"SkyGen Energy, LLC "	530	10/30/2000	R	NMPC 230 or 115 kV	NMPC	(No Filing)	2004
77	Dover Energy	"Titan Development, LLC"	1000	11/17/2000	P	Pl. Valley- Long Mt. Tie- Line	CONED	(No Filing)	2005
78	Ravenswood Repowering Ph I	"KeySpan Ravenswood Services, LLC "	440	12/04/2000	P	Vernon Substation	CONED	(No Filing)	2005
79	Harlem River Yards	NYPA	79.9	12/05/2000	C	Hell Gate Substation	CONED	N/A	2001
80	Hell Gate	NYPA	79.9	12/05/2000	C	Hell Gate Substation	CONED	N/A	2001
81	Vernon Blvd	NYPA 7	9.9	12/05/2000	C	Vernon Substation	CONED	N/A	2001
82	N First St and Grand Ave	NYPA	44	12/05/2000	C	Vernon- Greenwood line	CONED	N/A	2001
83	23rd St and 3rd Ave	NYPA	79.9	12/05/2000	C	Gowanus Substation	CONED	N/A	2001
84	Fox Hills	NYPA	44	12/05/2000	C	Fox Hills Substation	CONED	N/A	2001
85	Brentwood	NYPA	44	12/05/2000	N/A	Brentwood 69 kV	LIPA	N/A	2001
86	NRG Astoria	NRG	79.9	01/15/2001	A	Astoria	CONED	N/A	2002
87	Buchanan Energy	"Titan Development, LLC "	500	02/26/2001	P	Buchanan	CONED	(No Filing)	2005
88	Halfmoon Energy	"Titan Development, LLC "	500	02/26/2001	P	Rotterdam- Bear Swamp line	NMPC)	(No Filing)	2005
89	Project Neptune DC Phase 2	"Atlantic Energy, LLC"	1200	03/15/2001	A	"Rainey, Farragut, or W49th St"	CONED	N/A	2003
90	Fortistar VP	"Fortistar, LLC "	80	03/20/2001	P	Fresh Kills	CONED	(No Filing)	2002
90	Fortistar VAN	"Fortistar, LLC "	80	03/20/2001	P	Goethals/Fresh Kills	CONED	(No Filing)	2002
92	Indian Point Energy Center	Entergy Power Generation Corp.	300	04/10/2001	P	Buchanan	CONED	(No Filing)	2004
93	Brooklyn Terminal	Amerada Hess Corp.	79.9	05/01/2001	P	ConEd 138 kV (tbd)	CONED	N/A	2002
94	PSEG Power In- City Project	"PSEG Power Development, LLC "	2500	05/11/2001	P	W49th Street	CONED	N/A	2003- 4
95	Project Neptune DC Phase 2A	"Atlantic Energy, LLC "	750	05/22/2001	A	Newbridge Road	LIPA	N/A	2003
96	Glenwood Gas Plant	KeySpan Energy Development Corp.	79.9	05/22/2001	N/A	Glenwood 69 kV	LIPA	N/A	2002
97	"C3T, Inc. (JFK Expansion) "	Calpine Eastern Corporation	45	05/29/2001	A	Jamaica	CONED	N/A	2002
98	South Glens Falls Expansion	NYSEG Solutions	40	06/15/2001	P	Mohican- Butler# 18 line	NMPC	N/A	2002
99	PJM- New York City HVDC	TransEnergie US Ltd.	990	06/22/2001	P	W49th St and/or Farragut	CONED	N/A	2003
100	Rock Tavern Transformer	Central Hudson Gas &	N/A	06/28/2001	P	Rock Tavern	CHG& E	N/A	2002

**Exhibit 6-2 Proposed Interconnection in NYISO (Continued)**

Site #	Project Name	Owner/Developer	Size (MW)	Date of Study Application	S	Interconnection Point	Utility	Status of Article X	Proposed In-Service
101	Blooming Grover Power	Electric "Titan Development, LLC "	500	07/02/2001	P	Rock Tavern- Ramapo line	CONED	(No Filing)	2005
			38,551"						



## Exhibit 6-3 NYCA Proposed Interconnections



## **7. NYISO Demand, Energy, and Fuel Price Projections**

This section describes NYISO's assessment about how the region's load is projected over the next 10 years. This projection is based on the current planning reported by NYISO. These NYISO data are assessed, and used as the basis for the region's forecast which will be utilized by the GEMSET team. This section covers the following subjects:

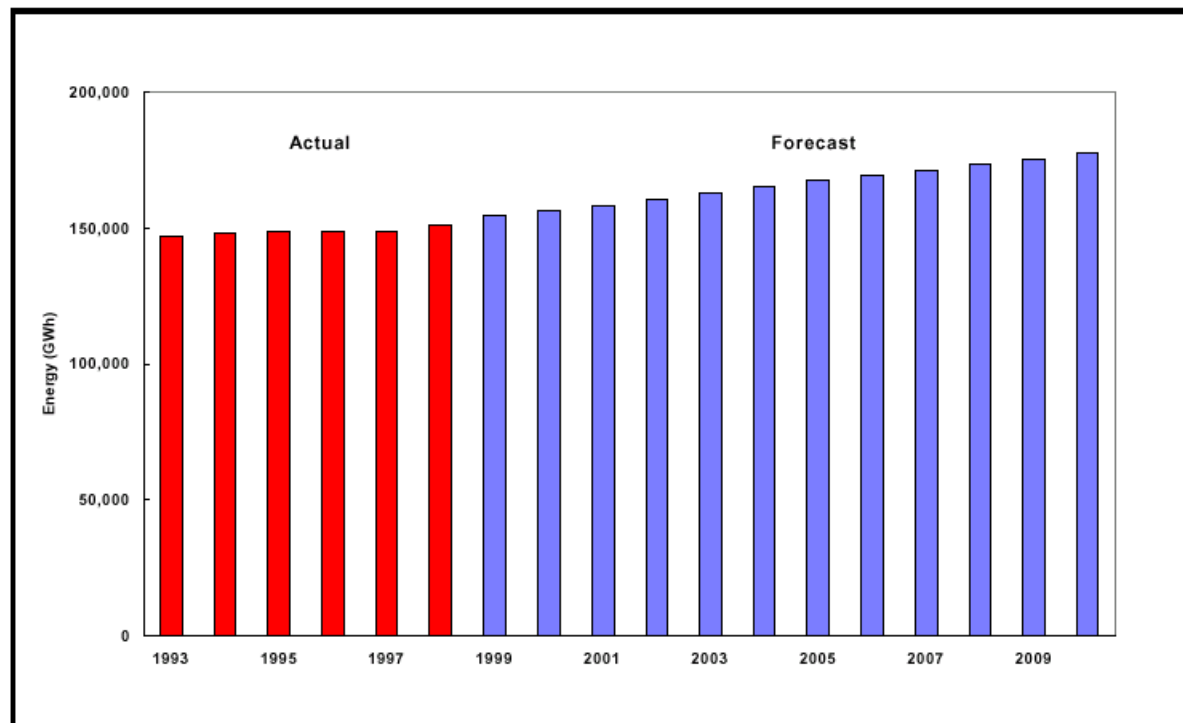
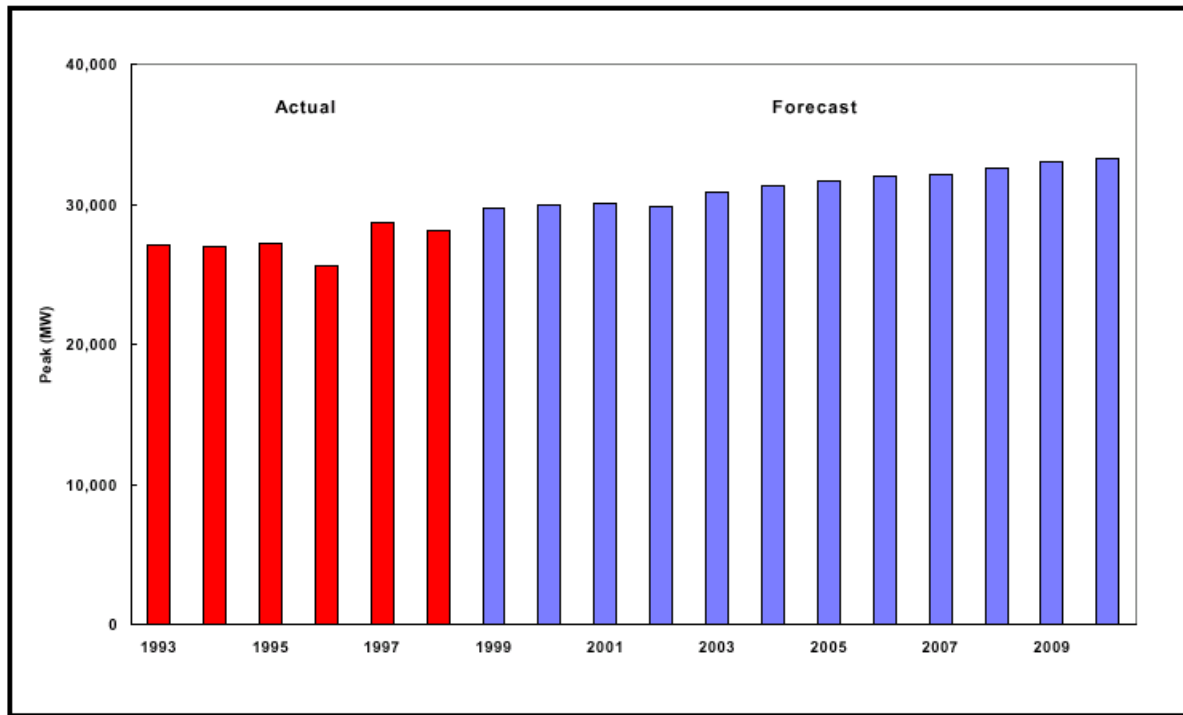
- Section 7.1 gives NYISO demand and energy growth projections for the region, beginning on page 7-59.
- Section 7.2, beginning on page 7-63, documents NYISO's historical and forecast fuel prices for generation.

### **7.1 Demand and Energy Growth Projection**

The long term forecast using the forecast models described in this report produce an energy system with peaks growing at 1.15% annually and total energy consumption growing at 1.4% annually. The forecast models have two main sets of drivers: weather and trends. The weather drivers are based on the 1991 actual weather data for the state of New York obtained from Weather Bank Inc. (Weather Bank). This year represents a peak weather year and is used for system design. The trend driver is based on long-term economic forecasts, which include the number of households, electric heating and cooling saturation and efficiencies, and manufacturing and non-manufacturing employment. The economic drivers were provided by RFA for 1999 through 2010.

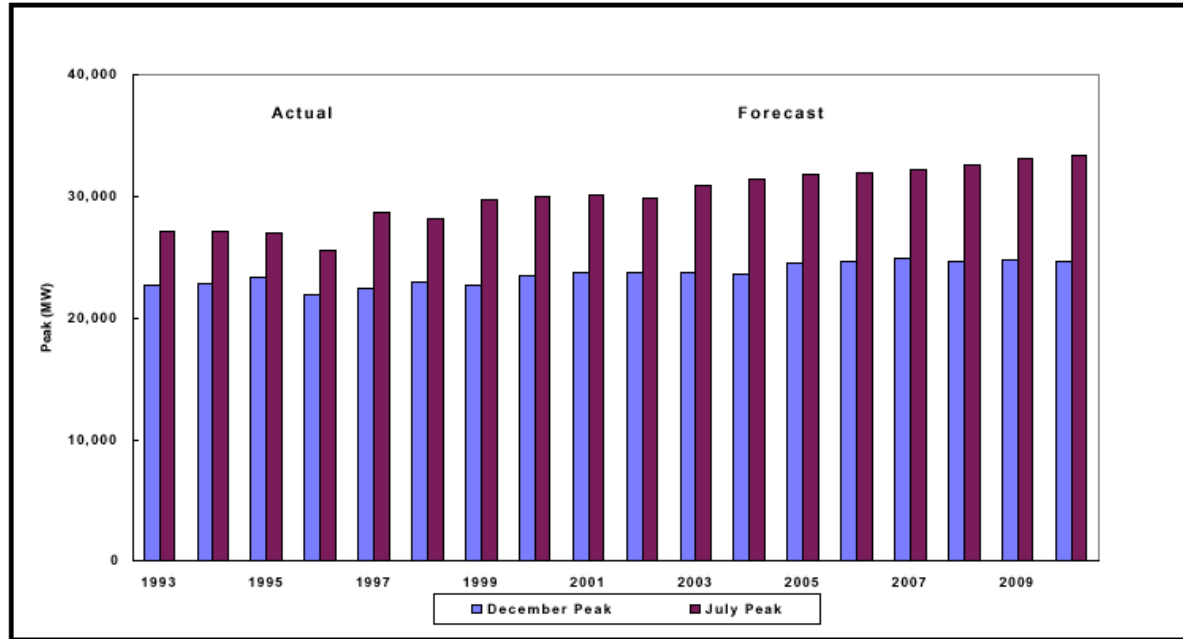
The model results show the system peak growing from 29,736 MW in 1999 to 33,347 MW in 2010. Associated energy demand is growing from 154,500 GWh in 1999 to 177,619 GWh in 2010. Exhibit 7-1 shows these growth trends in both demand and energy.

**Exhibit 7-1  
NYISO Demand & Energy Forecast**



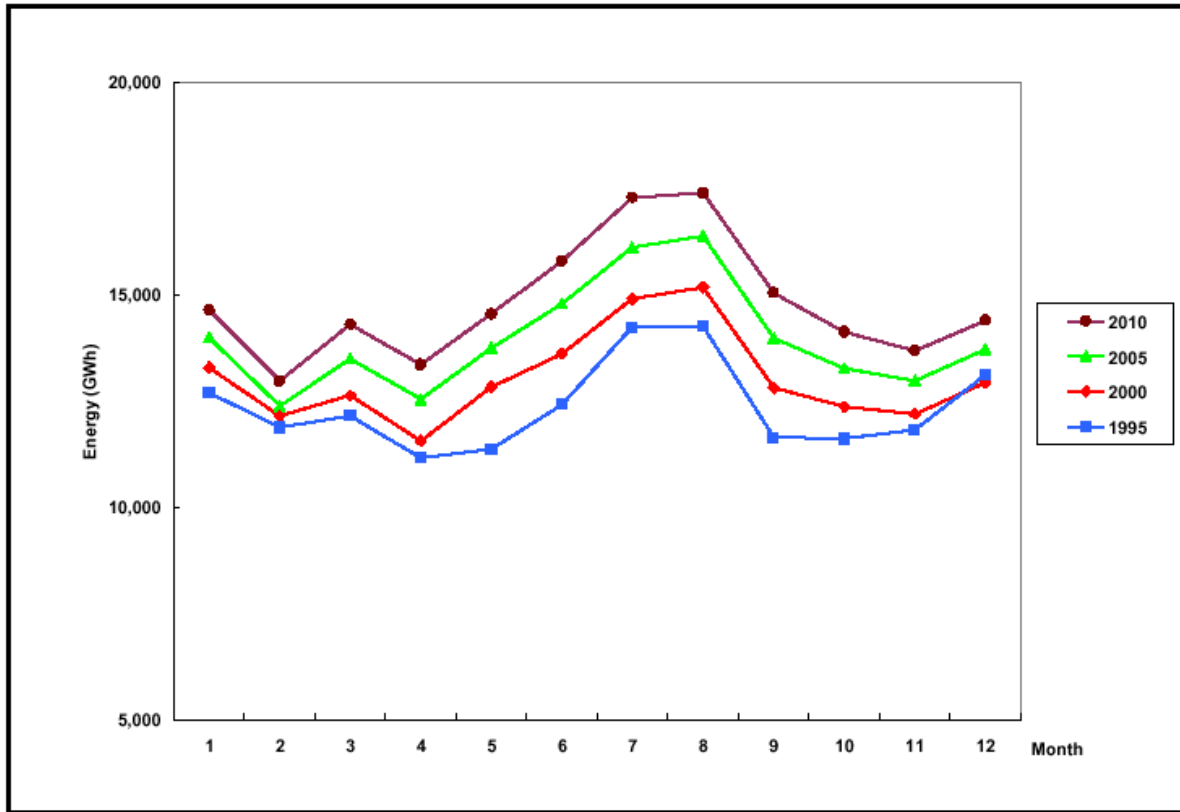
A distinguishing feature of the forecast is the changing shape of the New York system load. Through time, the summer peaks are growing faster than winter peaks. This change is captured in Exhibit 7-2, which shows the July peak growing at 1.15% and the December peak growing at 1.0%.

**Exhibit 7-2**  
**Summer & Winter Peaks (MW)**



Similar to Exhibit 7-2, Exhibit 7-3 also shows increasing summer energy consumption relative to winter energy consumption. In 1996, the December consumption was approximately 95% of the July consumption. By 2010, the December consumption drops to 83% of the July consumption.

### Exhibit 7-3 Monthly Energy Relationships



Overall, NYISO expects to experience an increase in required capacity of about 3,600 MW over the next 10 years. This represents an increase of almost 20 percent over that time period. When retirements are taken into consideration, NYISO estimates that almost 6,000 MW of new capacity will be required through 2010.

#### 7.1.1 Baseload Demand Projections

With the projections provided by NYISO from their planning departments, it is apparent that little diversity is expected in their load characteristics between now and 2010. Annual and monthly load factors remained relatively constant over the time period of their analysis. Therefore, based on the projections provided, baseload requirements will only increase by approximately 4,000 MW through year 2010. It is expected that this baseload generation will be provided by the more than 30,000 MW currently in the NYISO queue.

### 7.1.2 Peaking Demand Projections

With the peak load increasing almost 3,600 MW in the next 10 years, NYISO's actual peak load generation requirements will likely increase by about 3,000 MW to almost 9,000 MW from today's 6,000 MW level. NYISO expects all of that new generation will be supplied by combustion turbines fueled by natural gas.

## 7.2 Fuels Forecast for the NYISO Region

Region 1 – New England

**Region 2 – Mid-Atlantic**

Region 3 – East North Central

Region 4 – West North Central

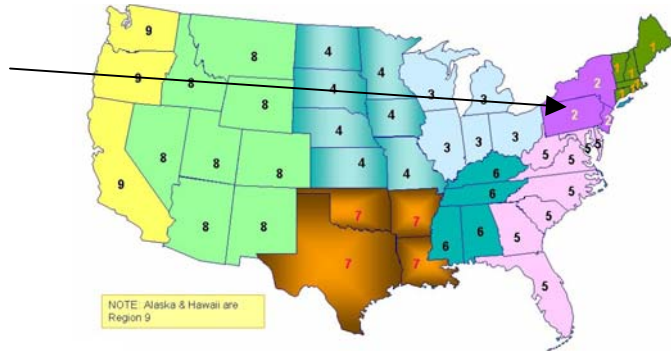
Region 5 – South Atlantic

Region 6 – East South Central

Region 7 – West South Central

Region 8 – Mountain

Region 9 – Pacific



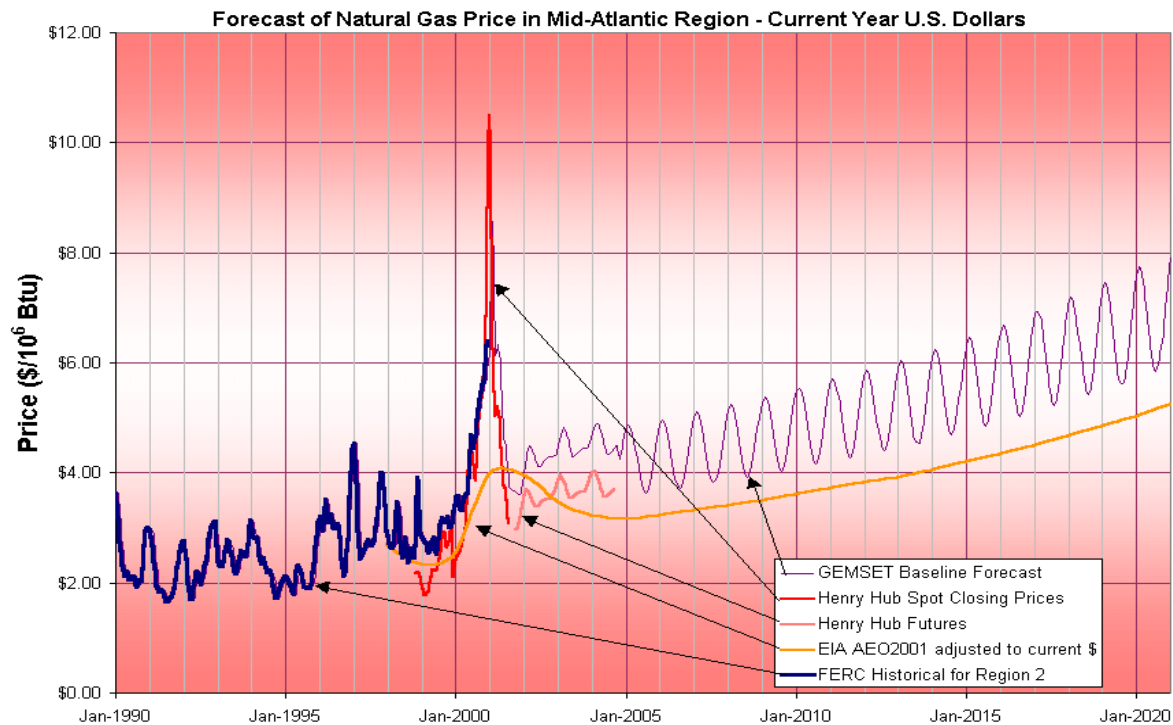
This section discusses the fuel prices that existed in the region and describes the forecast expectations for the region. Region 2 is made up of the following states as reported by FERC: Pennsylvania, New York, and New Jersey. All data is contained in tables available in the Fuels Characterization prepared by the GEMSET team.<sup>1</sup>

## 7.2.1 Natural Gas Prices

The delivered natural gas price to generating company owners in the region are reported on FERC Form 423. Recent gas price historical and projected data for the region are shown in Exhibit 7-4. This data is reported on a monthly basis with a six month lag in the reports.

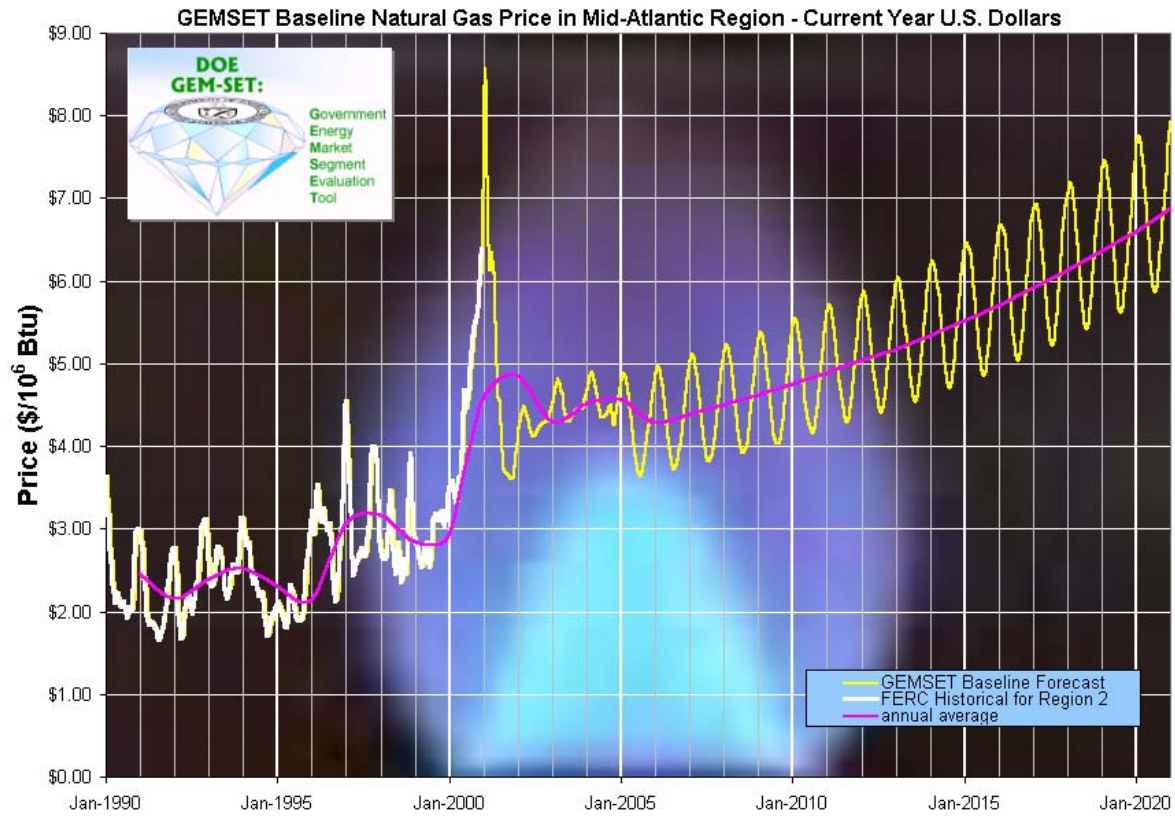
### Exhibit 7-4

#### GEMSET Baseline Natural Gas Price Projection for the Mid-Atlantic Region in Current Year U.S. Dollars Compared to the Data Sources Used for the Projections





### Exhibit 7-5 GEMSET Baseline Natural Gas Price Projection for the Mid-Atlantic Region in Current Year U.S. Dollars

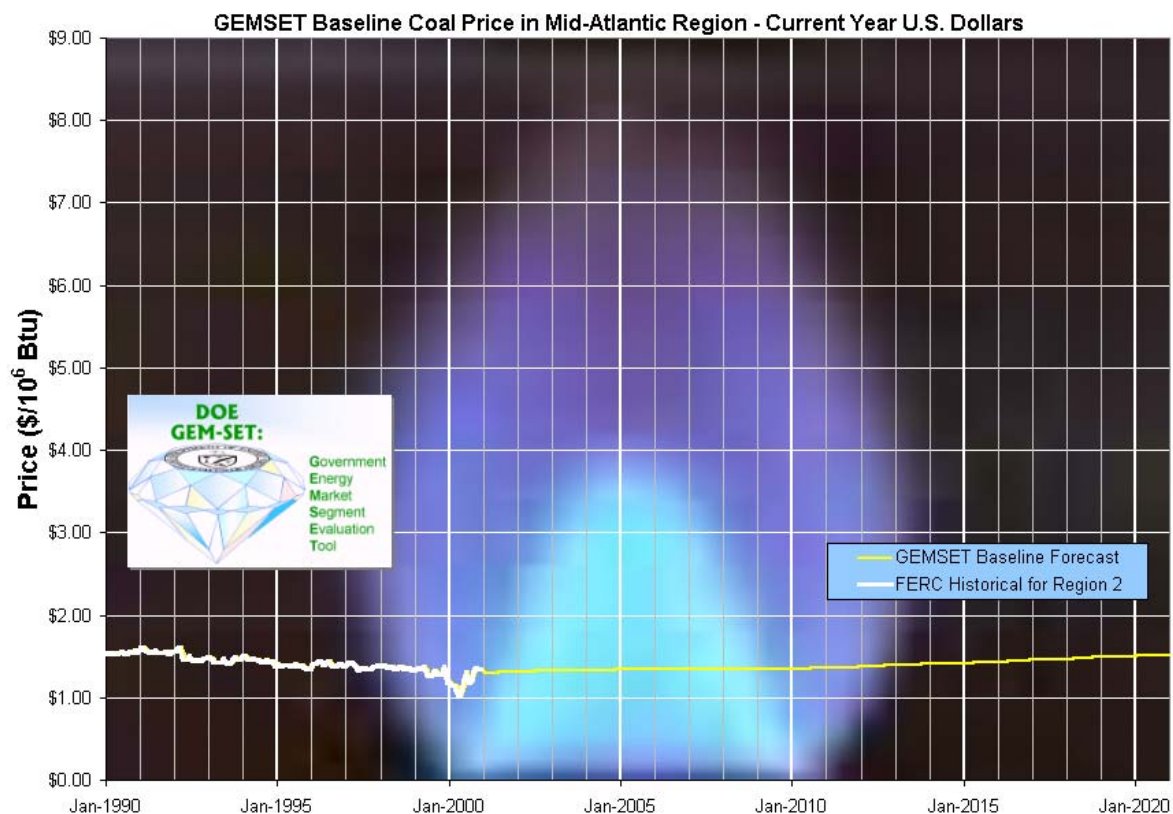


Periodically, these data will be revised to reflect changes in actual prices, and to adjust the forecasts to gas futures market changes, and changes in the NEMS economic modeling.

## 7.2.2 Coal Price in Mid-Atlantic Region

The Historical coal price in the Mid-Atlantic Region has been stable over the last few years, averaging between \$1.25-1.35 / 10<sup>6</sup> Btu. This price is expected to continue for the short term, but rising slightly in the long-term. Exhibit 7-6 shows the historical and projected prices for coal.

**Exhibit 7-6**  
**GEMSET Baseline Coal Price Projection for the Mid-Atlantic Region in Current Year U.S. Dollars**



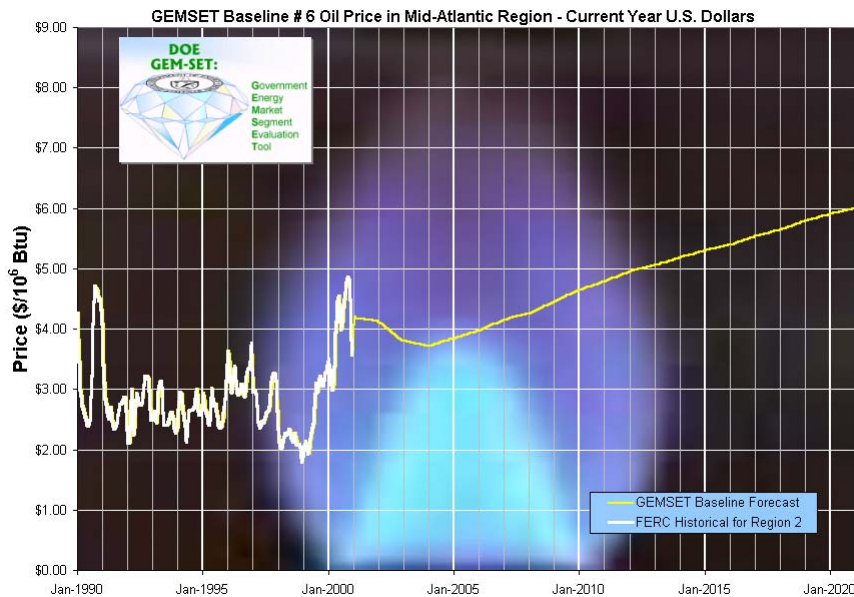
### 7.2.3 Oil Prices in the Mid-Atlantic Region

The Exhibits below indicate the historical and projected prices for #2 and #6 fuel oil in the region. As with all of the regions, there are individual ratios developed for each fuel based on the historical relationship on a national basis versus the regional prices. Those ratios are presented in the analysis itself.

**Exhibit 7-7 # 2 Oil Price in the Mid-Atlantic Region**



**Exhibit 7-8 # 6 Oil in the Mid-Atlantic Region**



## 8. References

The references used to prepare this report include the following:

- 
- <sup>1</sup> Weinstein, R.E., Herman, A.A., and Lowe, J.J. GEMSET Assessment: Fuels Characterization. Parsons Report No. EJ-2001-06. Draft. August 23, 2001.